

New species, records and synonymies of West Palaearctic Pamphaginae (Orthoptera: Caelifera: Pamphagidae)

BRUNO MASSA

Dipartimento Demetra, Università di Palermo, viale delle Scienze 13, 90128 Palermo, Italy

Abstract. The author analyses the species of some West Palaearctic genera of Pamphaginae, namely *Euryparyphes*, *Paraeuryparyphes*, *Glauia*, *Pseudoglauia*, *Glauvarovia*, *Prionosthenus*, *Lativertex*, *Ocnerosthenus*, establishing the following synonymies: *Euryparyphes olcese* (Bolivar 1907) = *Euryparyphes bolivari* (Stål 1876); *Euryparyphes paraflexuosus* La Greca 1993 = *Euryparyphes flexuosus* Uvarov 1927; *Glauia durieui rubripes* Morales Agacino & Descamps 1968 = *Glauia durieui durieui* (Bolivar 1878); *Prionosthenus lebanicus* Dirsh 1950 = *Prionosthenus femoralis* Werner 1938; *Prionosthenus (Lativertex)* Koçak & Kemal 2011 = *Paranothrotus* Mishchenko 1951. Further, the author confirms the synonymies: *Euryparyphes vaucherianus* (Saussure 1887) = *Euryparyphes bolivari* (Stål 1876); *Euryparyphes kenitranus* Werner 1932 = *Euryparyphes bolivari* (Stål 1876); *Euryparyphes stali* (Bormans 1879) = *Euryparyphes laetus* (Bolivar 1907); *Euryparyphes septentrionalis* Werner 1932 = *Euryparyphes laetus* (Bolivar 1907). Additionally, the author rises to species level *Glauia tricolor* Morales Agacino & Descamps 1968 **stat. nov.**, which had described as a subspecies of *G. saharae*, and describes the new species *Prionosthenus descampsi* **sp. n.** and *Ocnerosthenus poggii* **sp. n.** Finally, the author proposes a new key to species of *Euryparyphes*, *Paraeuryparyphes*, *Glauia*, *Prionosthenus* and *Ocnerosthenus*.

Resumé. Nouvelles espèces, données et synonymies de Pamphaginae ouest-paléarctiques (Orthoptera : Caelifera : Pamphagidae). L'auteur a conduit une étude des espèces ouest-paléarctiques des genres *Euryparyphes*, *Paraeuryparyphes*, *Glauia*, *Pseudoglauia*, *Glauvarovia*, *Prionosthenus*, *Lativertex* et *Ocnerosthenus*. Il établit les synonymies suivantes: *Euryparyphes olcese* (Bolivar 1907) = *Euryparyphes bolivari* (Stål 1876); *Euryparyphes paraflexuosus* La Greca 1993 = *Euryparyphes flexuosus* Uvarov 1927; *Glauia durieui rubripes* Morales Agacino & Descamps 1968 = *Glauia durieui durieui* (Bolivar 1878); *Prionosthenus lebanicus* Dirsh 1950 = *Prionosthenus femoralis* Werner 1938; *Prionosthenus (Lativertex)* Koçak & Kemal 2011 = *Paranothrotus* Mishchenko 1951. Il confirme les synonymies: *Euryparyphes vaucherianus* (Saussure 1887) = *Euryparyphes bolivari* (Stål 1876); *Euryparyphes kenitranus* Werner 1932 = *Euryparyphes bolivari* (Stål 1876); *Euryparyphes stali* (Bormans 1879) = *Euryparyphes laetus* (Bolivar 1907); *Euryparyphes septentrionalis* Werner 1932 = *Euryparyphes laetus* (Bolivar 1907). Enfin, il élève au niveau d'espèce *Glauia tricolor* Morales Agacino & Descamps 1968 **stat. nov.**, qui a été décrite comme sous-espèce de *G. saharae*, et décrit les nouvelles espèces *Prionosthenus descampsi* **sp. n.** et *Ocnerosthenus poggii* **sp. n.** En conclusion, il propose une nouvelle clé au niveau spécifique pour les genres *Euryparyphes*, *Paraeuryparyphes*, *Glauia*, *Prionosthenus* et *Ocnerosthenus*.

Keywords: taxonomic revision, key to species, synonymies, *Prionosthenus descampsi* **n.sp.**, *Ocnerosthenus poggii* **n.sp.**

Pamphagidae is a family of Orthoptera comprising about 370 taxa in the West Palaearctic. These taxa are members of 27 genera within the subfamily Thrinchinae Stål 1876, and of 43 genera in the subfamily Pamphaginae (Eades *et al.* 2011). Pamphaginae are characterized by very reduced or absent tegmina, with most apterous species lacking also tympana on the first tergite and Krauss's organs on the second. I am working on a revision of some groups of this family with the aims of preparing a monograph containing all the taxa of West Palaearctic. I report here the results obtained

examining specimens of eight genera of Pamphaginae listed below.

Materials and methods

This work is mainly based on the study of specimens from the following institutions: Muséum National d'Histoire Naturelle, Paris; Museo Civico di Storia Naturale, Milan; coll. B. Massa, University of Palermo. Specimens were photographed with a Nikon Coolpix 4500 digital camera, mounted on a Wild M5 Stereomicroscope. Mounted specimens were measured with a digital calliper (precision 0.01 mm); because precise measurement of wingless insects with large abdomen is difficult, total length was measured from the vertex to the apex of hind femur. Taxa that are herein considered to be synonyms are within square brackets.

Abbreviations. Muséum National d'Histoire Naturelle, Paris (MNHN); Naturhistorisches Museum, Vienna (NMW); Museo Nacional de Ciencias Naturales, Madrid (MNCN);

E-mail: bruno.massa@unipa.it

Accepté le 22 mars 2012

Museo Civico di Storia Naturale, Milan (MSNM); Museo Regionale di Scienze Naturali, Turin (MSNT); Museo Civico di Storia Naturale 'G.Doria', Genoa (MSNG); coll. B. Massa, University of Palermo (BMCP).

Results and discussion

Genus *Euryparyphes* Fischer 1853

This genus was described as a subgenus of *Porthetis* Serville 1831, with the type species *terrulentus* (Serville 1831). Kirby (1910) elevated it to the genus level. Its characters are the bi-pointed prosternal process, straight or slightly sloping vertex, not protruding; median keel of pronotum longitudinally furrowed (in some taxa visible at high magnification), more or less raised or straight pronotum, generally interrupted by the transverse sulcus (with some exceptions); lateral keels present or just evident (they are more evident when the median keel is straight). Mesosternal space as wide as high in males and wider than high in females, metasternal space two times wider than high in males, three times in females. Hind border of pronotum undulated; tegmina oval, ca. two times longer than high, brown with a whitish dorsal side, marked with a narrow brown line (absent in some species). First abdominal tergites are toothed. Dorsal keel of hind femurs undulated or with very small spines, inner ventral keel with very small spines (La Greca 1993; Llorente del Moral & Presa Asensio 1997). Males are 20-30% smaller than females. *Euryparyphes* is closely related to *Paraemigis* Bolívar 1914. According to Chopard (1943) the latter is characterized by a prosternal gorget, but La Greca (1993) considers that only the shape of the aedeagus valves permits the separation of the two genera; in contrast to *Euryparyphes*, *Paraemigis* has a pair of small circular crests dorsally placed at the base of the apex of the aedeagus, and its apical part bears two pairs of terminal lobes. In this paper I will treat all the species recently listed by La Greca (1993) and Llorente del Moral & Presa Asensio (1997) and will propose a key to taxa that I consider valid. To provide detailed information and to clarify my assessments, I will reproduce some drawings of original papers of the authors cited above (see Acknowledgements).

It is difficult to divide species of this genus into groups; we may recognize species with pronotum median keel raised and with less evident lateral keels and other species with the pronotum median keel not raised, and with nearly straight or straight and more evident lateral keels. These differences, however, are evident only on one sex (male), while females seem to be more homogeneous.

Commented list of species

Euryparyphes bolivari (Stål 1876)

= *Euryparyphes vaucherianus* (Saussure 1887)

Material examined. Morocco (ex MNMS) (♂); Laguna Guedira (♀) (MSNM); Tangier (1♂ 1♀ lectotypes; 3♂♂ 1♀, all ex Saussure); Tangier (2♂♂, 4♀♀); Tangier 24.VI.1957, Uvarov & Rungs (♀); Maroc, Vaucher (2♀♀); Cap Spartel 1903 (♂) (MNHN).

E. bolivari is characterized as having the pronotum keel not interrupted by the transverse sulcus. The types coming from Malaga, originally preserved in the Brunner collection (NMW), are probably lost. One male specimen preserved at the MNMS possibly belonging to the type series, consented to Llorente del Moral & Presa Asensio (1997) to consider the types of this species the sole specimens collected in Spain. These authors have also established the synonymy *Euryparyphes vaucherianus* (Saussure 1887) = *Euryparyphes bolivari* (Stål 1876), and consequently they have considered it a Moroccan species, by chance found in Spain.

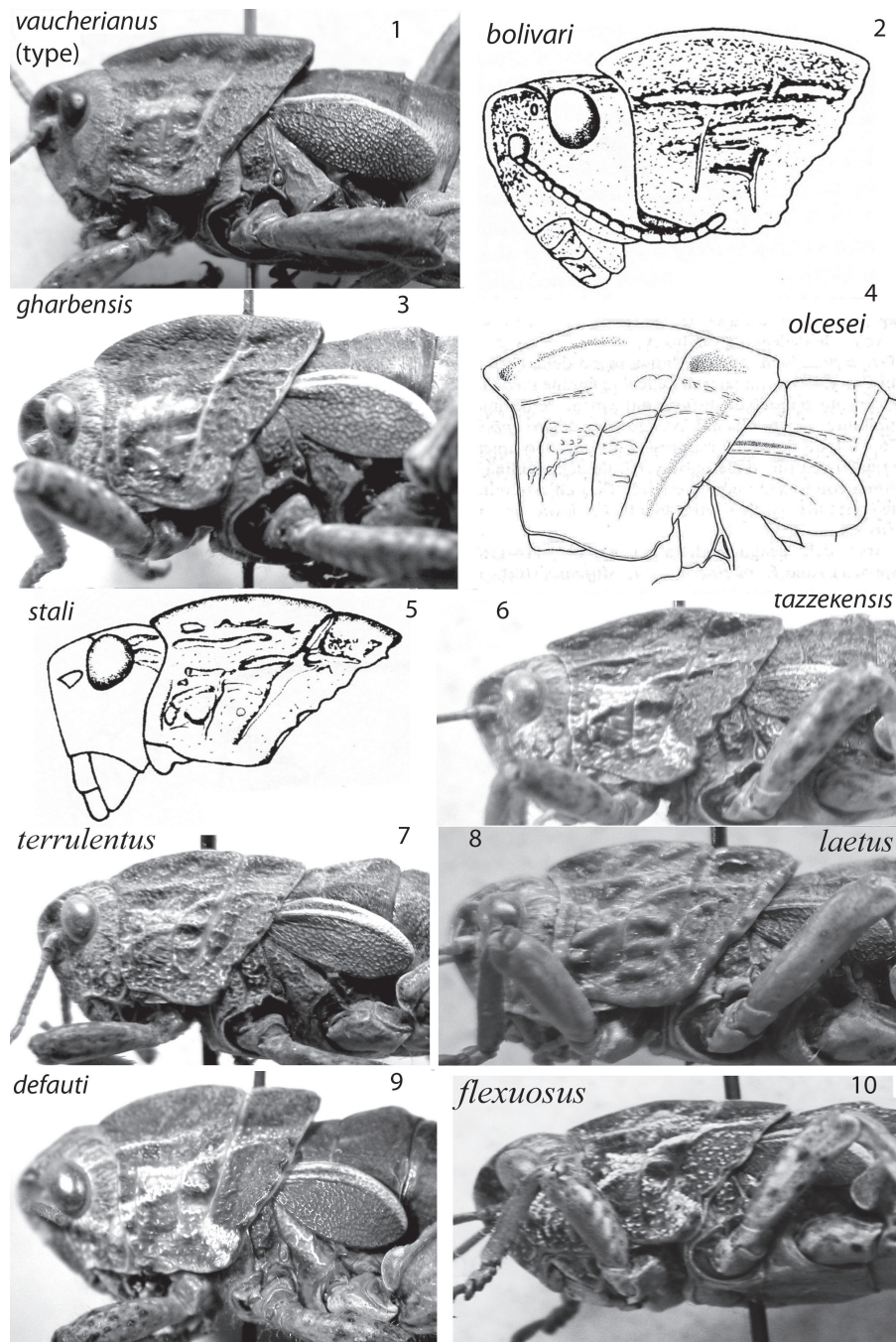
It is large and easily identified by its pronotum, which is high, laterally compressed, and raised, and by its pronotum keel, which is not interrupted by the transverse sulcus (figs. 1, 2, 11, 12). In contrast to what is generally reported (cf. Eades *et al.* 2011), types of *E. vaucherianus* are preserved in the MNHN; the drawing of Saussure (1887) matches rather well characters of the female, with the exception of tegmen, which is more oval on the drawing than on the type (cf. figs. 11, 12). Antennal segments are longer than wide. The inner side of the hind femurs is ochreous-greenish. Genitalia of this species have been depicted by La Greca (1993), and even though the drawing of ventral view represents a different angle than the drawing of genitalia of *E. bolivari* by Llorente del Moral & Presa Asensio (1997), and even though anterior processes of epiphallus are longer in *vaucherianus* than in *bolivari* (figs. 33–39), the drawn specimens seem to belong to the same species. Thus, *E. bolivari* should cover South Spain (until now, only types have been recorded) and North West Morocco. It has a spring-summer phenology.

[*Euryparyphes olcese* (Bolívar 1907)]

According to La Greca (1993), *E. olcese* is a valid species, differing from *E. vaucherianus* (= *bolivari*) because its transverse sulcus nearly reaches the apex of the median keel, and its tegmina are more rounded. In examining specimens of *E. bolivari*, however, I found that the length of transverse sulcus is quite variable (fig. 4); additionally, the *E. olcese* genitalia depicted

by La Greca (1993) correspond very well to those of *E. bolivari* (see above) (compare figs. 35–37 with 33–34 and 38–39). The type of *E. olcese* (preserved at MNMS) was collected at Tetouan, which lies within

the range of *E. bolivari*, and Llorente del Moral & Presa Asensio (1997) have listed the type of *E. olcese* within the examined material of *E. bolivari*. Thus, I consider *E. olcese* to be a synonym of *E. bolivari*.



Figures 1–10

1, Type male of *Eurypteryphes vaucherianus* (= *E. bolivari*) (MNHN); 2, Pronotum profile of the male of *E. bolivari* after Llorente del Moral & Presa Asensio (1997); 3, *E. gharbensis* holotype (MNHN); 4, *E. olcese* (= *E. bolivari*) after La Greca (1993); 5, *E. stali* (= *E. laetus*) male after Llorente del Moral & Presa Asensio (1997); 6, *E. tazzekensis* male from J. Tazzeke (Morocco) (MNHN); 7, *E. terrulentus* male from Ronda (Spain) (BMCP); 8, *E. laetus* male from Sidi Abdellah (Morocco) (MNHN); 9, *E. defauti* holotype male (MNHN); 10, *E. flexuosus* male from Azrou (Morocco) (MNHN).

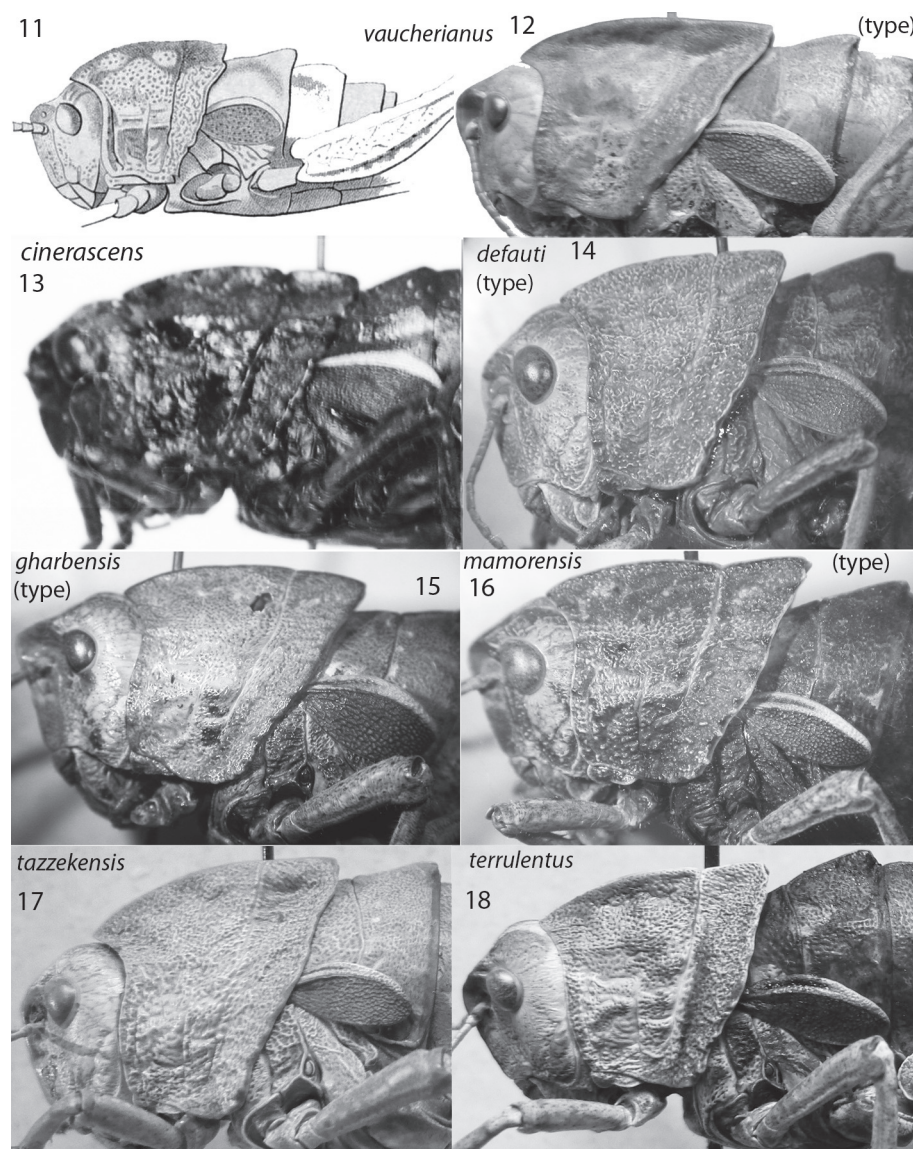
[*Euryparyphes kenitranus* Werner 1932]

Werner (1932a) described *E. kenitranus* based on a single female collected at Kenitra (which is within the range of *E. bolivari*), and compared *E. kenitranus* with *E. olcese*. Because its pronotum is not interrupted by transverse sulcus, however, *E. kenitranus* has been considered a subspecies of *E. vaucherianus*. La Greca (1993) confirmed that *E. kenitranus* is a synonym of *E. vaucherianus* (now *E. bolivari*).

Euryparyphes gharbensis Defaut 1987

Material examined. Morocco: Ksar el Kebir 29.IV.1984 (♂) (MSNM); Sidi Yahya du Rharb 22.IV.1985, Defaut (♂ holotype, ♀ allotype); Bab Tiliouine 5.VI.1966, Rungs (8♂♂, 7♀♀); Akarrat (2♂♂ 2♀♀); 40 km before Ketama 3.VII.1966, Descamps (♂) (MNHN).

This large species covers an area south of that of *E. bolivari* (between Kenitra and Ksar-el-Kebir) and another area on the Rif. It was described as subspecies of *E. laetus* (Defaut 1987a), and consequently considered



Figures 11–18

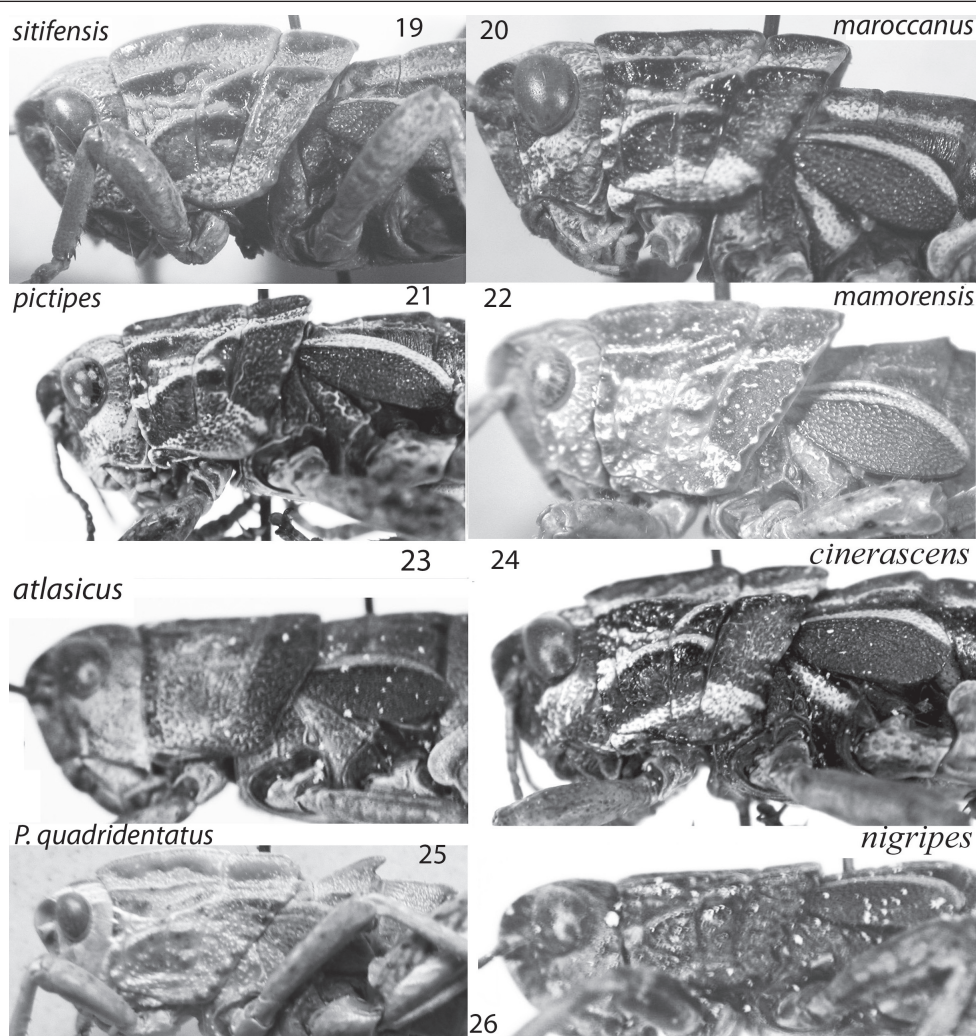
11, Original drawing (horizontally turned) of female of *Euryparyphes vaucherianus* (= *E. bolivari*) after Saussure (1887); **12**, Type female of *E. vaucherianus* (= *E. bolivari*) (MNHN); **13**, *E. cinerascens* allotype female (MSNM); **14**, *E. defauti* allotype female (MNHN); **15**, *E. gharbensis* allotype female (MNHN); **16**, *E. mamorensis* allotype female (MNHN); **17**, *E. tazzekensis* female from J. Tazzeke (Morocco) (MNHN); **18**, *E. terrulentus* female from Ronda (Spain) (BMCP).

a valid species by La Greca (1993). The inner side of the hind femurs is pink-reddish or ochreous, and the hind tibiae are black. The shape of the vertex of *E. gharbensis* is similar to that of *E. bolivari*; in lateral view the vertex is slightly protruding, not sloping. *E. gharbensis* differs from *E. bolivari* in that the median keel of its pronotum is less raised and is clearly interrupted by the transverse sulcus, and its tegmina are more oval (figs. 3, 15). Its genitalia are similar to those of *E. maroccanus* (compare figs. 51–53 with 48–50). It has a spring-summer phenology. Holotype and allotype of this species have been presented by B. Defaut to the Museum of Paris, where they are now preserved.

Euryparyphes defauti La Greca 1993

Material examined. Morocco: Oulmès 5.VIII.1985 (♂ holotype, ♀ allotype) (MNHN); idem (♂ ♀ paratypi) (MSNM); Ain Leuh 22.V.1985, G. Sama (♀) (BMCP).

Smaller than the species previously treated here, *E. defauti* inhabits small, woody areas south of Meknès. Its pronotum is compressed and enlarged in the metazona; the median keel is raised and interrupted by the sulcus, and the hind border of the pronotum is festooned (figs. 9, 14). The tegmina are as oval as those of *E. gharbensis*. The inner side of the hind femurs is ochreous, and the tibiae are black. The genitalia of *E. defauti* are similar to those of *E. cinerascens* (compare figs. 78–80 with 74–77). *E. defauti* has a summer



Figures 19–26

19, *Euryparyphes sitifensis* male from Oran (Algeria) (MNHN); 20, *E. maroccanus* male from Gada Debdou (Morocco) (MNHN); 21, *E. pictipes* male from Ibel Hebri (Morocco) (MNHN); 22, *E. mamorensis* allotype female (MNHN); 23, *E. atlasicus* paratype male (MSNM); 24, *E. cinerascens* holotype male (MSNM); 25, *Paraeuryparyphes quadridentatus* male from Ben Tumi (Morocco) (MNHN); 26, *E. nigripes* paratype male (MSNM).

phenology. Holotype and allotype of this species have been presented by B. Defaut to the Museum of Paris, where they are now preserved.

Euryparyphes tazzekensis La Greca 1993

Material examined. Morocco: J. Tazzeka 2.VII.1968 (♂ paratypus) (MSNM); J. Tazzeka 6.VII.1965, Descamps (2♂♂, 7♀♀); Tazzeka, Bab Boudir 30.V.1964 (6♂♂ 2♀♀) (MNHN).

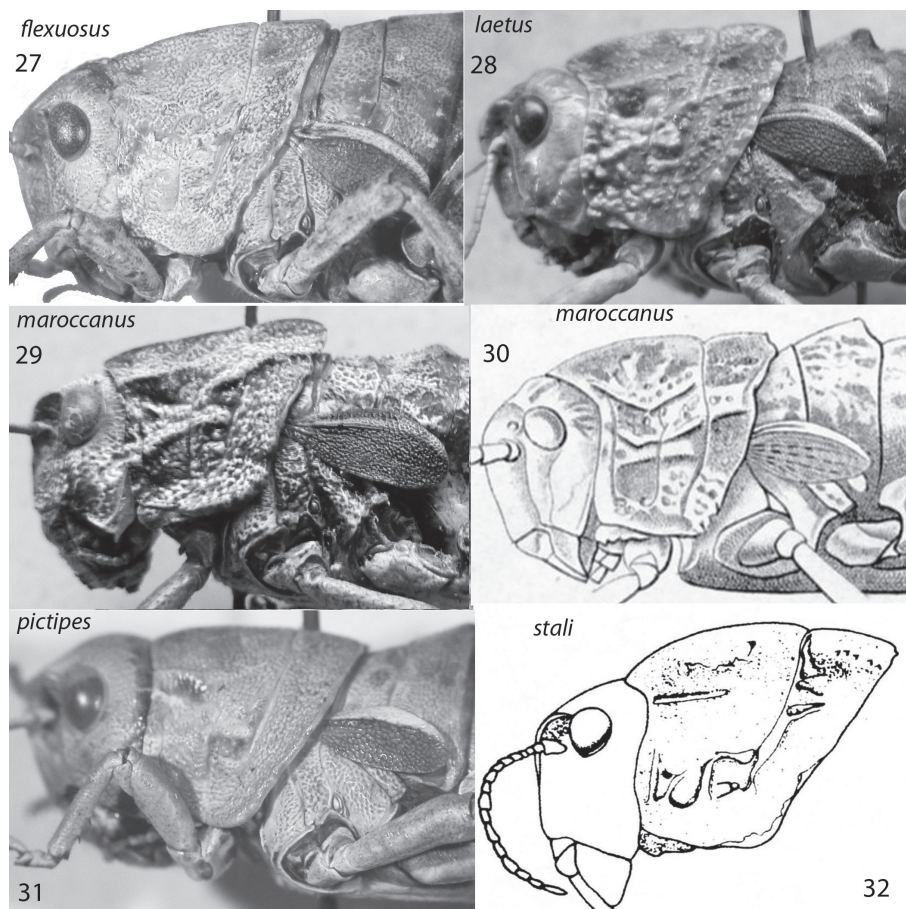
Distributed in the Middle Atlas (J. Tazzeka, J. Bou Iblane) and on Oued Sebou, est of Fès, *E. tazzekensis* is very similar to *E. laetus*; the similarity is greater for males than for females (compare figs. 6, 17 with 8, 28). Males of *E. tazzekensis* are identifiable by the shape of the genitalia, which are similar to those of *E. maroccanus* (compare figs. 54–56 with 48–50). The tegmina of *E. tazzekensis* are as oval as those of *E. gharbensis*. The inner side of the hind femurs is ochreous or reddish,

and the tibiae are red-blackish or black. *E. tazzekensis* has a spring-summer phenology.

Euryparyphes laetus (Bolivar 1907)

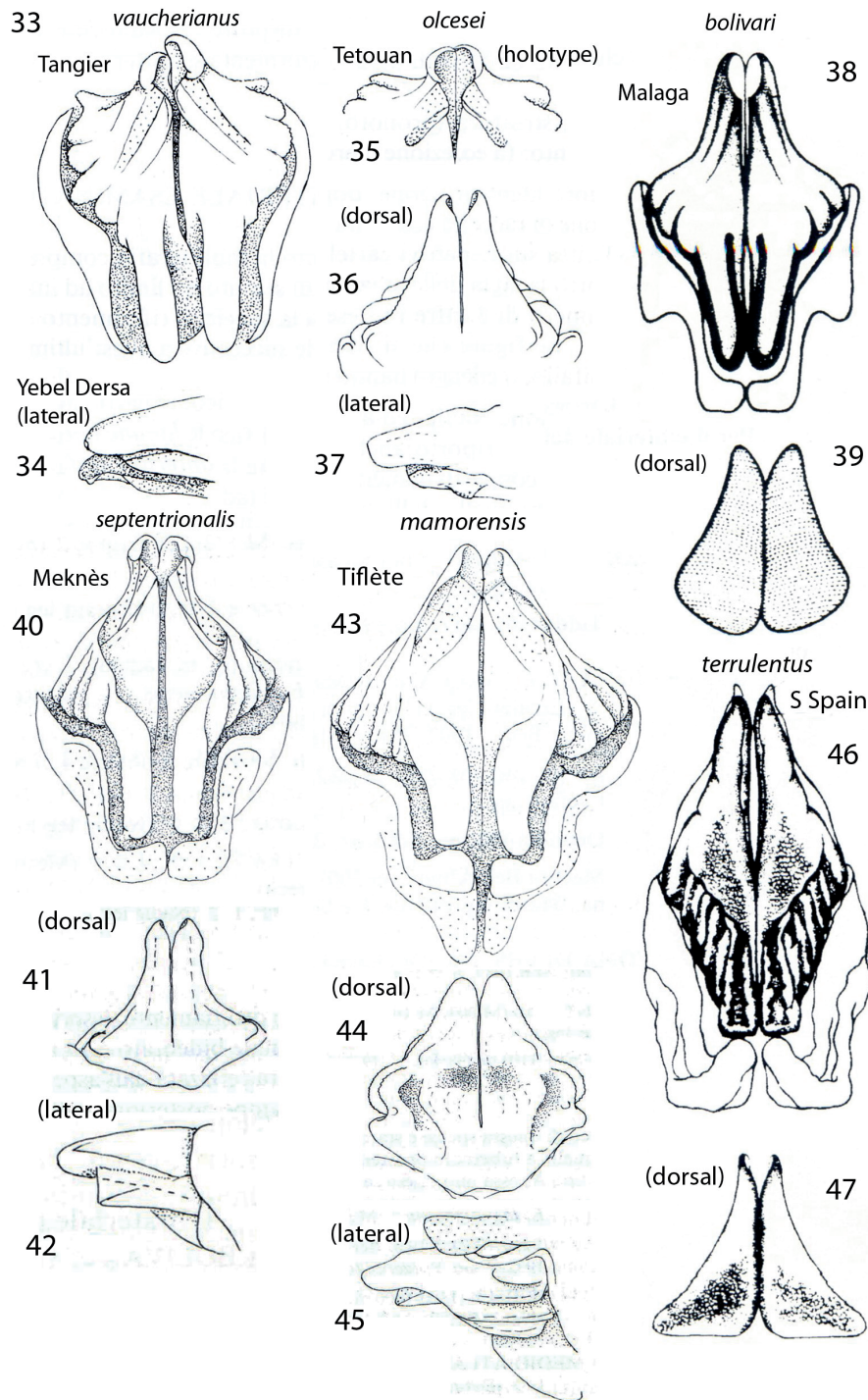
Material examined. Morocco: Forêt Sehoul 25.VI.1984 (♂); Sidi Kahye des Zaer 16.IV.1983 (♀) (MSNM); Mogador (♂♀ paratypi); Sidi Abdellah (Bab Azhar) 29.V.1964 (3♂♂, 3♀♀); Ain Behera (15 km from Taza) 30.V.1964 (2♂♂, 2♀♀); El Marcha 14.IV.1966 (2♂♂, 2♀♀); between Boulemane and Ifrane (♂♀); 12 km N Ifrane (♂♀); Imouzzar (8♂♂ 10♀♀); Ito (♂♀); Sefrou (2♂♂, 3♀♀); Mazagan VI.1907, Escalera (2♂♂, 5♀♀ paratypi of *mazaganicus*); M. Soun 21.V.1949, Rungs (2♂♂ as *fezzanus*); Ain Igly, Aher Moumou VI.1955 (1♂ as *fezzanus*) (MNHN); Tazert 27.IV.1995, A. Carapezza (♀) (BMCP).

The pronotum of both sexes is moderately raised, laterally compressed, interrupted by the sulcus, enlarged posteriorly (mainly in the male), with the hind lower border slightly bulging. The lateral keels are



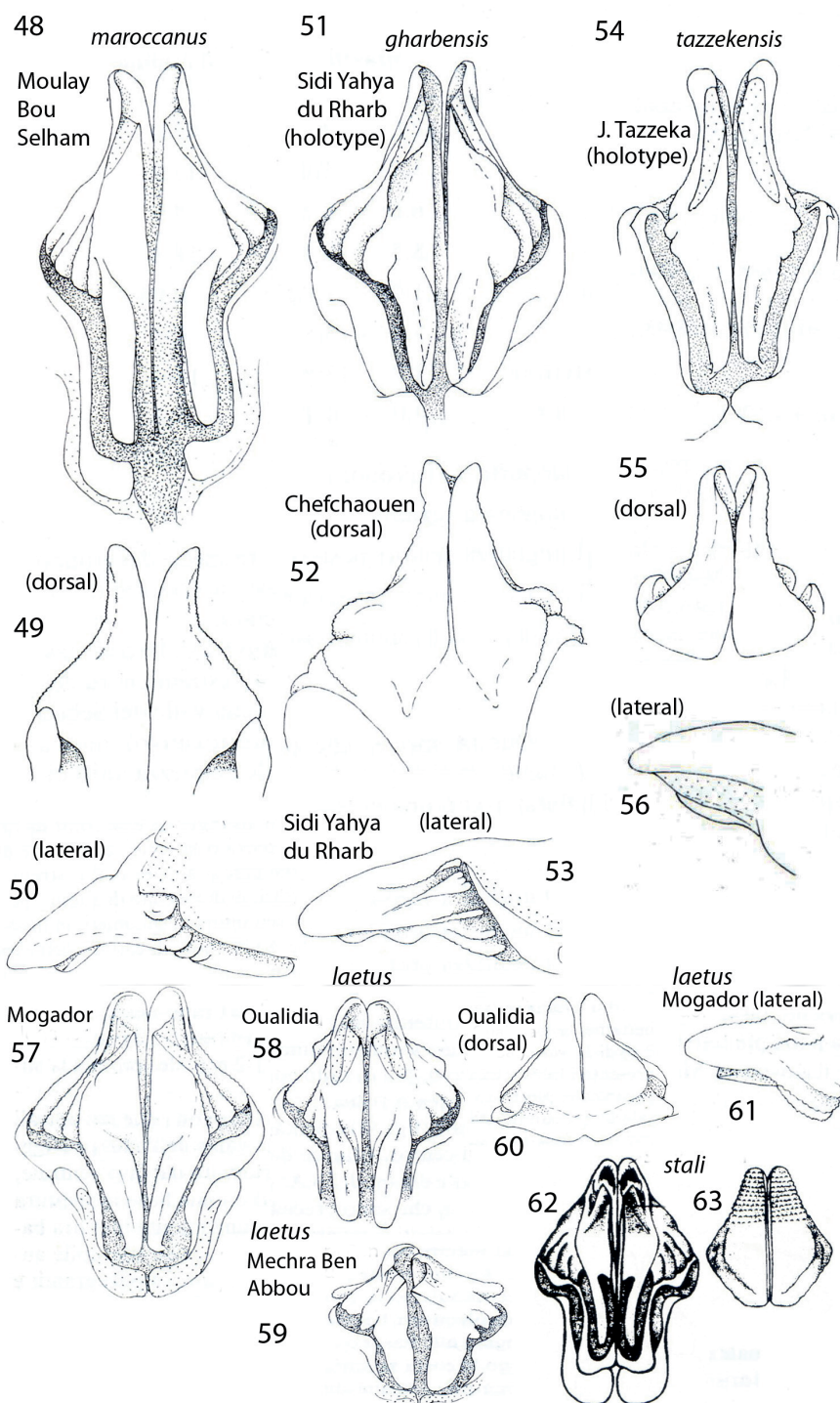
Figures 27–32

27, *Euryparyphes flexuosus* female from Azrou (Morocco) (MNHN); 28, *E. laetus* female from Sidi Abdellah (Morocco) (MNHN); 29, *E. maroccanus* female from Gada Debdou (Morocco) (MNHN); 30, Original drawing (horizontally turned) of female of *E. maroccanus* after Saussure (1887); 31, *E. pictipes* paratype female (MSNM); 32, *E. stali* (= *E. laetus*) female after Llorente del Moral & Presa Asensio (1997).



Figures 33–47

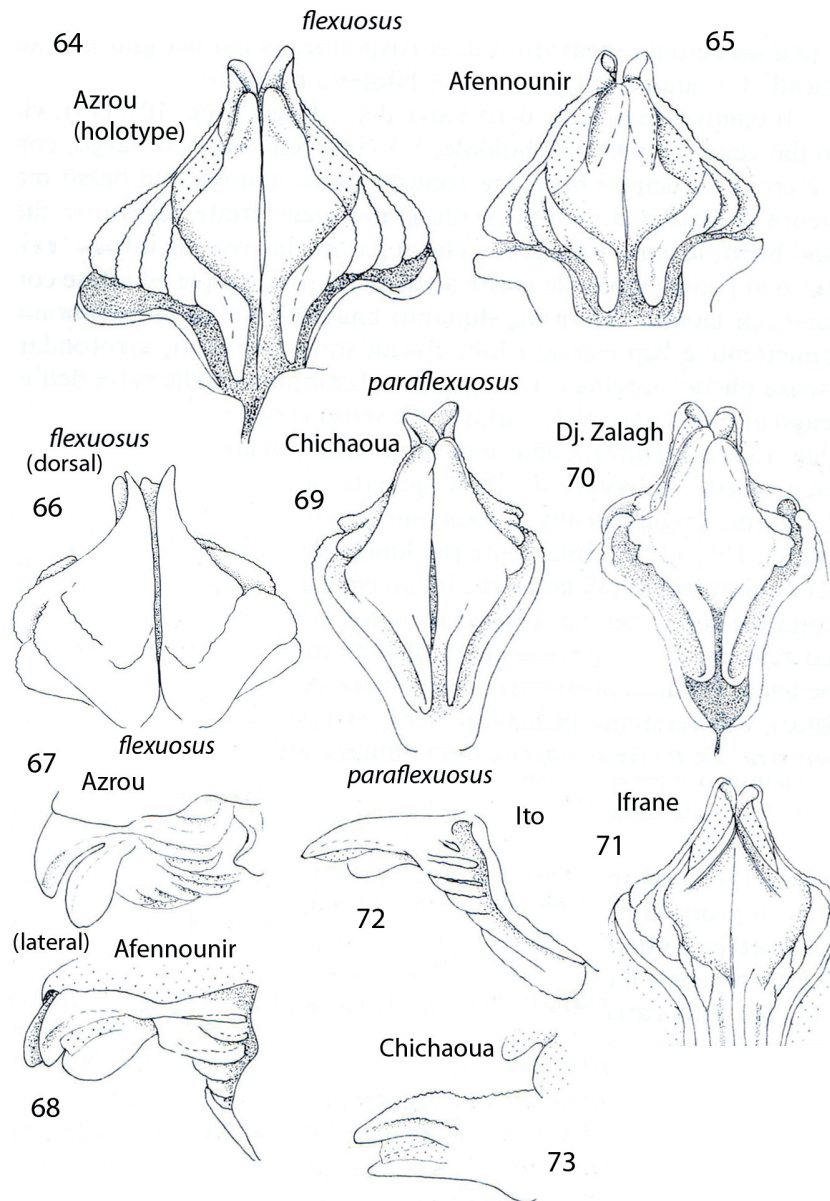
33, Ventral view of aedeagus sclerites of *Euryparyphes vaucherianus* (= *E. bolivari*) from Tangier (Morocco); 34, Lateral view of aedeagus sclerites of *E. vaucherianus* (= *E. bolivari*) from Yebel Dersa (Morocco); 35, Ventral view of aedeagus sclerites of *E. olcese* (= *E. bolivari*) holotype from Tetouan (Morocco); 36, Dorsal view of the same; 37, Lateral view of the same; 38, Ventral view of aedeagus sclerites of *E. bolivari* type from Malaga; 39, Dorsal view of the same; 40, Ventral view of aedeagus sclerites of *E. septentrionalis* (= *E. laetus*) from Meknès (Morocco); 41, Dorsal view of the same; 42, Lateral view of the same; 43, Ventral view of aedeagus sclerites of *E. mamorensis* from Tiflète (Morocco); 44, Dorsal view of the same; 45, Lateral view of the same; 46, Ventral view of aedeagus sclerites of *E. terrulentus* from Spain; 47, Dorsal view of the same. Figs. 33, 34, 35, 36, 37, 40, 41, 42, 43, 44, and 45 after La Greca (1993), Figs. 38, 39, 46, and 47 after Llorente del Moral & Presa Asensio (1997).

**Figures 48–63**

48, Ventral view of aedeagus sclerites of *Eurypteryphes maroccanus* from Moulay Bou Selham (Morocco); 49, Dorsal view of the same; 50, Lateral view of the same; 51, Ventral view of aedeagus sclerites of *E. gharbensis* holotype; 52, Dorsal view of aedeagus sclerites of *E. gharbensis* from Chefchaouen (Morocco); 53, Lateral view of aedeagus sclerites of *E. gharbensis* holotype; 54, Ventral view of aedeagus sclerites of *E. tazzekensis* holotype; 55, Dorsal view of the same; 56, Lateral view of the same; 57, Ventral view of aedeagus sclerites of *E. laetus* holotype; 58, Ventral view of aedeagus sclerites of *E. laetus* from Oualidia (Morocco); 59, Ventral view of aedeagus sclerites of *E. laetus* from Mechra Ben Abbou (Morocco); 60, Dorsal view of aedeagus sclerites of *E. laetus* from Oualidia; 61, Lateral view of aedeagus sclerites of *E. laetus* holotype; 62, Ventral view of aedeagus sclerites of *E. stali* (= *E. laetus*); 63, Dorsal view of the same. Figs. 48–61 after La Greca (1993), Figs. 62–63 after Llorente del Moral & Presa Asensio (1997).

callused, and the hind borders are festooned, mainly in the posterior angle (figs. 8, 28). The inner side of the hind femurs is brown-blackish, with a reddish base; the tibiae are blackish, and the inner spines of the hind tibiae are black. *E. laetus* phenology is mainly spring-early summer. Its distribution

includes central Morocco, from the Middle Atlas to Fès, Meknès, Rabat, and Casablanca, and the area of Agadir, where the types were collected; the ♀ collected at Tazert (East of Taroudant) confirms that this is the most southern species of *Euryparyphes*.



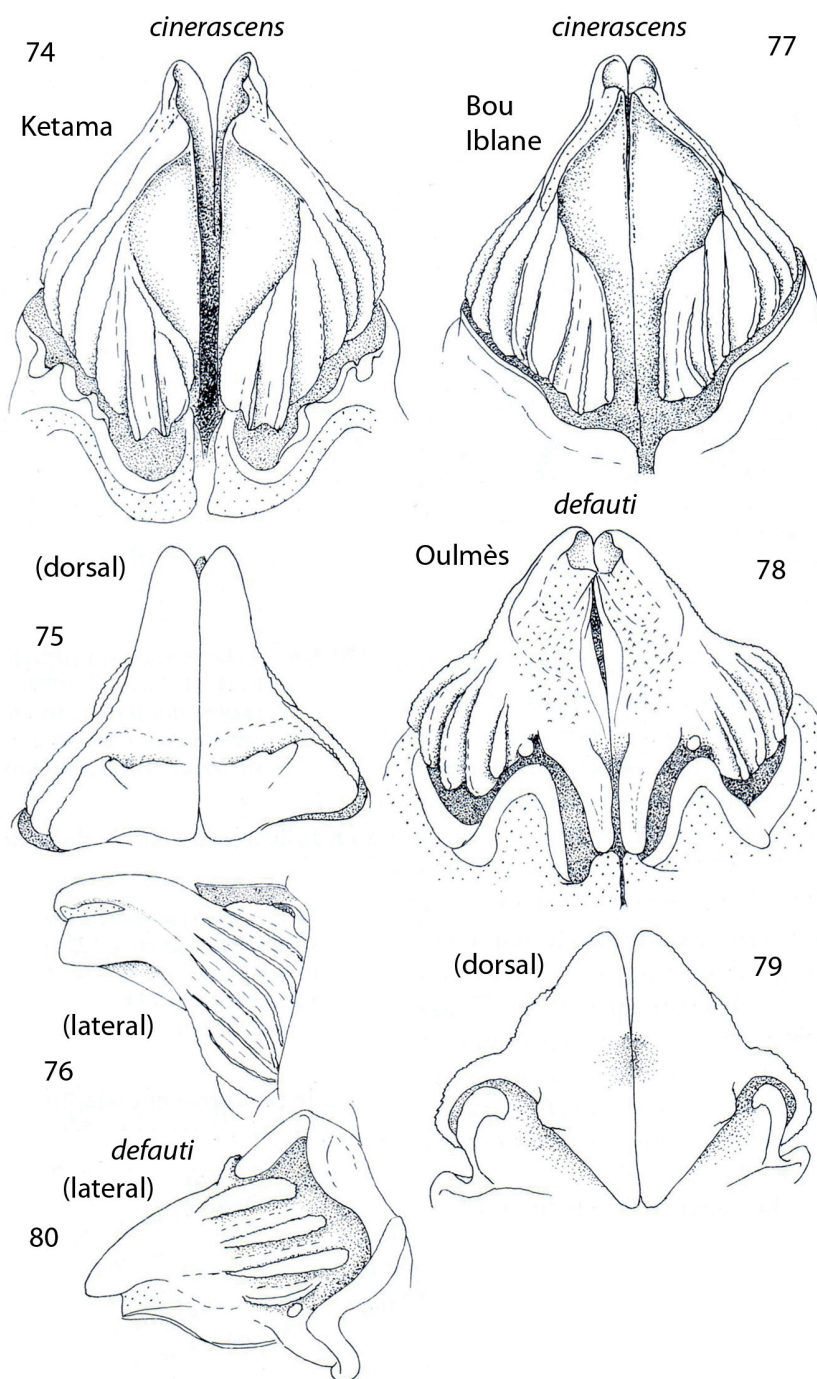
Figures 64–73

64, Ventral view of aedeagus sclerites of *Euryparyphes flexuosus* holotype; 65, Ventral view of aedeagus sclerites of *E. flexuosus* from Afennounir (Morocco); 66, Dorsal view of aedeagus sclerites of *E. flexuosus* holotype; 67, Lateral view of the same; 68, Lateral view of aedeagus sclerites of *E. flexuosus* from Afennounir (Morocco); 69, Ventral view of aedeagus sclerites of *E. paraflexuosus* (= *E. flexuosus*) from Chichaoua (Morocco); 70, Ventral view of aedeagus sclerites of *E. paraflexuosus* (= *E. flexuosus*) from Dj. Zalagh (Morocco); 71, Ventral view of aedeagus sclerites of *E. paraflexuosus* (= *E. flexuosus*) from Ifrane; 72, Lateral view of aedeagus sclerites of *E. paraflexuosus* (= *E. flexuosus*) from Ito; 73, Lateral view of aedeagus sclerites of *E. paraflexuosus* (= *E. flexuosus*) from Chichaoua. All figures after La Greca (1993).

[*Euryparyphes stali* (Bormans 1879)]

As indicated in its original description, *E. stali* was thought to have been collected from an unknown

(Brazil) locality in Portugal, but probably it was collected in Morocco. According to Llorente del Moral & Presa Asensio (1997) *E. stali* could be a junior



Figures 74–80

74, Ventral view of aedeagus sclerites of *Euryparyphes cinerascens* holotype; 75, Dorsal view of the same; 76, Lateral view of the same; 77, Ventral view of aedeagus sclerites of *E. cinerascens* from Bou Iblane (Morocco); 78, Ventral view of aedeagus sclerites of *E. defauti* holotype; 79, Dorsal view of the same; 80, Lateral view of the same. All figures after La Greca (1993).

synonym of *E. laetus mazaganicus*, which is currently considered a synonym of *E. laetus* (La Greca 1993). Like the latter species, *E. stali* has callused lateral keels of the pronotum, the hind border is festooned, and the median keel is interrupted by the sulcus (figs. 5, 32). The genitalia of types, which were depicted by Llorente del Moral & Presa Asensio (1997), match quite well with those of *E. laetus* (compare figs. 62–63 with 57–61). Thus, I consider *E. stali* to be a synonym of *E. laetus*.

[*Euryparyphes septentrionalis* Werner 1932]

This species has been described based on females collected at Bou Kellal and Dar Kaid Medboch, north of Taza (Werner 1932b), an area lying within the eastern part of the distribution of *E. laetus*. In the following year, Werner (1933) described the male, collected at Meknès, whose characteristics match quite well with those of *E. laetus* (La Greca 1993) (compare genitalia of figs. 40–42 with 57–61). Because it is very difficult to identify females in the absence of males, *E. septentrionalis* should be cautiously considered a synonym of *E. laetus*.

Euryparyphes mamorensis Defaut 1987

Material examined. Morocco: Tiflète 2.V.1985 (♂ holotype, ♀ allotype) (MNHN); idem (♂♀ paratypes) (MSNM).

E. mamorensis has been described as a subspecies of *E. maroccanus*, but La Greca (1993) raised it to the species level, and considered it to be related to *E. laetus* and *E. defauti*. The median keel is nearly straight in the male, and slightly raised in the female. The lateral borders of the pronotum are festooned, and protrudes a subacute angle (figs. 16, 22; compare genitalia of figs. 43–45 with 57–61 and 78–80). It has a spring phenology. *E. mamorensis* is known only from the area of Mamora near Tiflète. Holotype and allotype of this species have been presented by B. Defaut to the Museum of Paris, where they are now preserved.

Euryparyphes terrulentus (Serville 1838)

Material examined. Spain: Malaga, Rincon de la Victoria (♂) (MSNM); Malaga (7♂♂, 3♀♀); Chiclana (3♂♂, 4♀♀) (MNHN); Ronda 25.IV.1995, B.Massa (4♂♂, 3♀♀); Zahara V.1996 (♀) (BMCP).

This is a medium-sized species, that is characterized by its laterally compressed pronotum, with the median keel slightly raised and interrupted by the sulcus; it has a sloping vertex and callused paranota. The hind borders of the pronotum are festooned (figs. 7, 18). The phallic complex is rather different from that of

North African species (figs. 46–47). The inner side of the hind femurs is ochreous-brownish, and the tibiae are black; the inner spines of the hind tibiae are yellow with an apical black ring. *E. terrulentus* has a spring-early summer phenology. According to Llorente del Moral & Presa Asensio (1997), *E. terrulentus* is the only species currently living in Spain, where it is distributed in the South.

Euryparyphes flexuosus Uvarov 1927

Material examined. Morocco: S Azrou, Afennourir 10.VII.1968 (♂) (MSNM); Azrou (1400 m) VI.1949 and 21.VI.1955 (6♂♂, 3♀♀); between Azrou and Timhadite 9.VII.1965, Descamps (2♂♂, 2♀♀); Daït Aona (Middle Atlas) 22.V.1965 (♂); Recifa (Middle Atlas) 6.VI.1964 (♂); El Hadjeb 22.VI.1955 (♀); Bou Angueur (Middle Atlas) 9–15.VI.1949 (3♀♀); Forêt de Jaïba (between El Hadjeb and Ifrane) (2♂♂, 2♀♀); Tamrabta (Middle Atlas) (4♂♂, 5♀♀); S Azrou, Toumliline (10♂♂, 8♀♀) (MNHN); Marrakech-Tazert 27.IV.1995, A.Carapezza (♀) (BMCP).

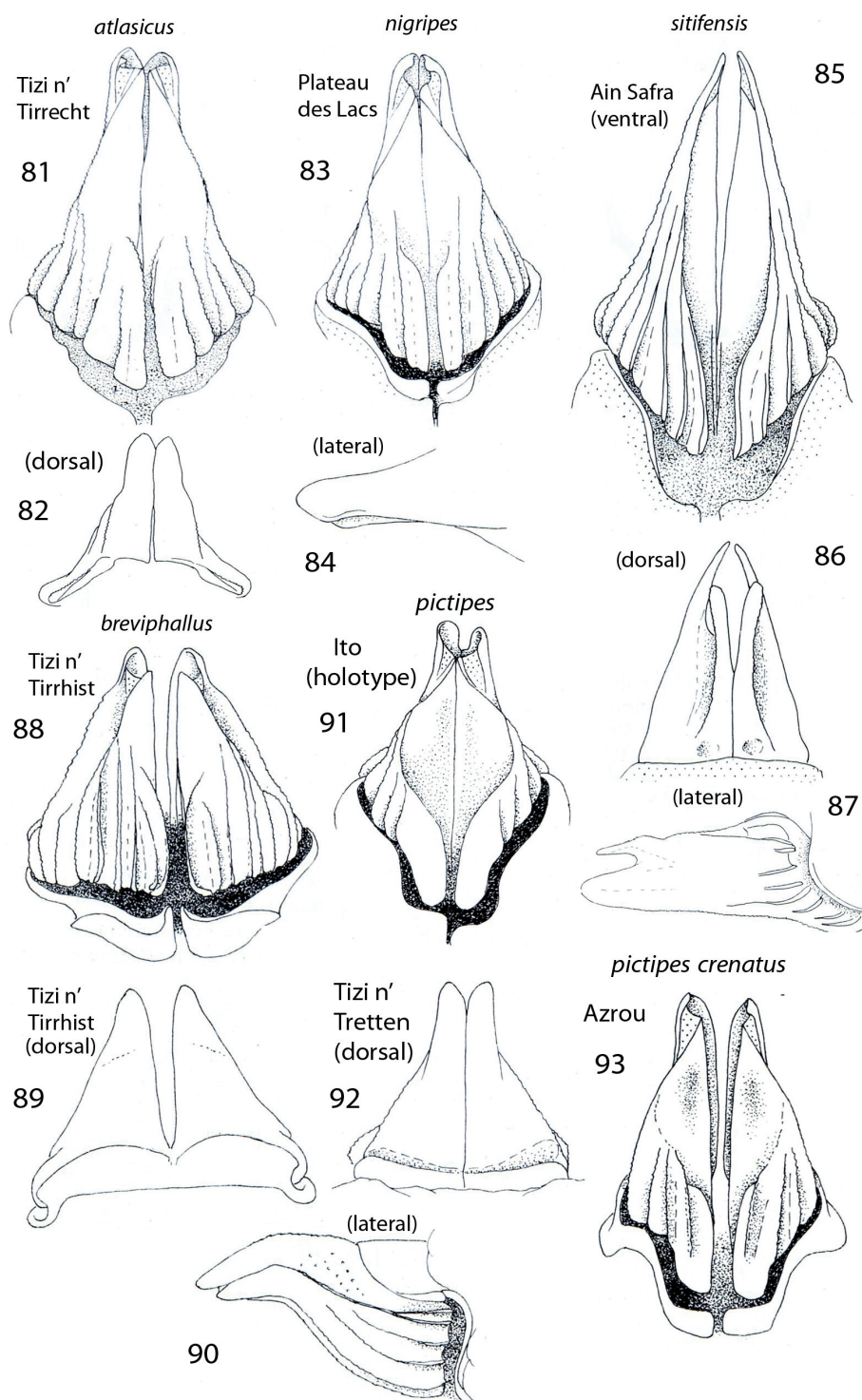
This species, living on the Middle and High Atlas, is characterized by an evident median keel, laterally compressed and posteriorly enlarged; the pronotum keel is evidently furrowed, paranota are callused-wrinkled, laterally concave. Lateral keels are evident in the prozona, less in the metazona, hind borders clearly festooned (figs. 10, 27). Abdominal tergites are keeled. Inner side of hind femurs is ochreous-reddish, tibiae black, inner spines of hind tibiae are black with pre-apical yellow or red ring (differently from *E. maroccanus*, which has inner spines of hind tibiae yellow with black apex). It has a spring-summer phenology.

[*Euryparyphes paraflexuosus* La Greca 1993]

According to La Greca (1993), this taxon should live on the eastern High Atlas, Middle Atlas and hills surrounding Fès and Marrakech, thus overlapping with *E. flexuosus*; the latter is very similar to *E. paraflexuosus*, differing only in the shape of the aedeagus valves, which, however, is variable in both presumed taxa (compare figs. 69–73 with 64–68). The only difference between *E. paraflexuosus* and *E. flexuosus* appears to be in the inner side of the hind femurs, which are black, orange or purple in the former, but ochreous-reddish in the latter. The *E. paraflexuosus* tibiae are black and the inner spines of the hind tibiae are black with a pre-apical yellow ring, as in *E. flexuosus*. I consider this taxon to be a synonym of *E. flexuosus*.

Euryparyphes maroccanus (Saussure 1887)

Material examined. Morocco: Sidi Amira 29.IV.1983 (♂♀) (MSNM); Oued Cherrat (Rabat) (1♂, 3♀♀); Port Leyantoy

**Figures 81–93**

81, Ventral view of aedeagus sclerites of *Euryparyphes atlasicus* paratype; **82**, Dorsal view of the same; **83**, Ventral view of aedeagus sclerites of *E. nigripes* paratype; **84**, Lateral view of the same; **85**, Ventral view of aedeagus sclerites of *E. sitifensis* from Ain Safra (Algeria); **86**, Dorsal view of the same; **87**, Lateral view of the same; **88**, Ventral view of aedeagus sclerites of *E. breviphallus* paratype; **89**, Dorsal view of the same; **90**, Lateral view of the same; **91**, Ventral view of aedeagus sclerites of *E. pictipes* holotype; **92**, Dorsal view of aedeagus sclerites of *E. pictipes* from Tizi n' Tretten (Morocco); **93**, Ventral view of aedeagus sclerites of *E. pictipes crenatus* (= *E. pictipes*) holotype. All figures after La Greca (1993).

(1♂, 2♀♀); Ain Dehaguena (2♂♂, 1♀); Souk Arba du Rharb 4.V.1955 (2♀♀); Oued Ikem (♀); Gada Debdou 4.V.1959 (3♀♀); Igoumalen, Beni Mesdri (♂♀); Jebala, Haoute el Kasdir 4-11.VII.1961, Rungs (9♂♂, 11♀♀); Cirque de Jaffar (♂) (MNHN).

The pronotum keel of *E. maroccanus* is straight and slightly raised so that a concavity occurs between its borders and lateral keels. The paranota are clearly callused and the hind borders are regular or slightly undulate. The tegmina are more oval than in *E. laetus*, and in many specimens the upper border is brownish (figs. 20, 29, 30). The inner side of the hind femurs is light; the inner and upper sides of the hind tibiae are reddish, yellowish or ochreous; and the inner spines of the hind tibiae are yellow with black apex. Differences are also evident in the shape of the aedeagus (compare figs. 48–50 with 58–61). *E. maroccanus* has a spring-summer phenology and has been recorded from localities of North West Morocco between Kenitra and El Jadida (South of Casablanca).

Euryparyphes cinerascens La Greca 1993

Material examined. Morocco: Ketama (Rif) 21.IV.1986 (♂ holotype, ♀ allotype) (MSNM).

The pronotum of *E. cinerascens* is a slightly enlarged in the metazona; its median keel is not distinctly furrowed longitudinally, nearly straight in the male, and is slightly raised in the female; the pronotum is compressed in the metazona. The shape of the pronotum is similar to that of *E. maroccanus*, and the lateral keels are more or less straight (figs. 13, 24). The brown stripe in the light dorsal area of the tegmina is absent, as is the case for *E. pictipes*. The inner spines of the hind tibiae are yellow with blackish apex. The genitalia are similar to those of *E. defauti* (compare figs. 74–77 with 78–80). *E. cinerascens* lives on the Rif and Middle Atlas.

Euryparyphes pictipes Uvarov 1927

Material examined. Morocco: Ifrane 12.II.1970 (♂); Tizi n' Tretten 9.VII.1968 (♀); Ain Dehaguena 2.V.1961, Rungs (2♂, 1♀); Midelt (2♂♂); Ifrane 24.V.1960 (2♂♂, 3♀♀); Ifrane 15-31.V.1938, Rungs (♂); Mischliffen (2000 m) 9.VII.1965, Descamps (1♂, 2♀♀); Aif Mohamed (Middle Atlas) 27.VI.1965, Descamps (♂♀); Ibel Hebri 9.VI.1959 (♂♀); Ain Nokra (3♀♀); Cedres de Gourand (♀); Berkire (♂♀); Dada Raho (3♂♂, 2♀♀); Cold de Tamont (3♂♂, 2♀♀); Boulemane (3♂♂, 6♀♀); Tamrabta (3♂♂, 2♀♀); El Hadjeb (♂); Imouzzet du Kandar (♀) (MSNM).

Uvarov (1927) described this species and the *crenatus* variety from two close localities of the Middle Atlas (Azrou and Ito); La Greca (1993) established that they belong to the same taxon (compare genitalia of

figs. 91 and 93). The *E. pictipes* pronotum is similar to that of *E. maroccanus*, slightly wider than long, and clearly enlarged in the metazona (as in *E. laetus*); the paranota are callused-wrinkled (as in *E. flexuosus*). The median keel of males is straight, and the area between it and the lateral keels is concave. In female the keel is slightly raised and the paranota are less callused and wrinkled than in the males. The brown stripe in the light dorsal area of tegmina is generally absent (but is present in the holotype) (figs. 21, 31). Abdominal keels are present in the metanotum and first tergites. The inner side of the hind femurs is orange or brown-blackish, the tibiae are red, and the inner spines of the hind tibiae are red with a black base and apex. *E. pictipes* has a spring-early summer phenology. According to La Greca (1993), *E. pictipes* is similar to *E. atlasicus* and *E. nigripes*, but its pronotum is enlarged and its median keel is stout.

Euryparyphes atlasicus La Greca 1993

Material examined. Morocco: Tizi n' Tirechi 14.VII.1968 (2♂, 2♀ paratype) (MSNM)

This is a very distinctive species, with a flat pronotum, that is not tuberculated or wrinkled; its keel does not protrude forward, and its lateral keels are straight and evident, just converging posteriorly. The fore border of the pronotum is straight, and the hind border is cut. The prosternal process is cubic, and the brown stripe in the light dorsal area of the tegmina is absent. The abdominal keel is present, but not very evident; lateral keels are visible only in the metanotum (fig. 23). Phallic complex: cf. figs. 81–82. The inner side of the hind femurs is yellow-ochreous, and the tibiae are ochreous or pinkish. *E. atlasicus* has been recorded only in the eastern part of High Atlas.

Euryparyphes nigripes La Greca 1993

Material examined. Morocco: Plan des Lacs (Haut Atlas) 28.VII.1970 (2♂, 2♀ paratype) (MSNM).

E. nigripes is closely related to *E. atlasicus*. Its pronotum is flat with scarce black tubercles, which are also present in the metanotum and the first tergite. The brown stripe in the light dorsal area of the tegmina is absent (fig. 26). Phallic complex: cf. figs. 83–84. The inner side of the hind femurs is brown-blackish, and the tibiae are blackish. *E. nigripes* lives in the eastern part of High Atlas and in the Middle Atlas.

Euryparyphes breviphallus La Greca 1993

Material examined. Morocco: Tizi n' Tirrhist, Ait Bou Guemes 2.VIII.1968 (2♂, 2♀ paratype) (MSNM).

The *E. breviphallus* pronotum is stout, not compressed, roof-like, and enlarged posteriorly; its fore border is rounded, and its hind border is cut and has bright tubercles. The median keel is clearly furrowed, straight, and slightly raised; lateral keels are barely evident. The abdomen is not keeled. Phallic complex: cf. figs. 88–90. The inner side of the hind femurs and tibiae are brown-blackish. This species lives on the High Atlas.

Euryparyphes sitifensis (Brisout 1854)

Material examined. Tunisia: between Feriana and Haidra (2♀♀); Algeria: Tikjda, Lac Goulmine (1♂); Takersan (2♂♂, 8♀♀); Forêt des Sahary (Djelfa) 24.V.1953 (♂); Oran 16.III.1879 (7♂♂, 4♀♀); Mecheria (2♂♂); Laghouat à Messaa (4♂♂ 8♀♀); Charef (20 km S Ben Yacoub) 18.VI.1953 (7♂♂, 7♀♀); Ben Yacoub 19.VI.1953 (♀); Bouira-Sahary, Zemzache-Tarhiara 25.V.1953 (3♂♂, 2♀♀); Laghouel (1♂, 2♀♀); J. Senalba IV.1893 (2♀♀); Bir Bab Ain (♀); Ain Sefra (2♂♂, 1♀); Mekalis (♂♀); Bou Chebka (♀); Tadmit (2♂♂, 3♀♀); Mansourah (Costantine) (♀); Morocco: Ain Boucif IV.1947

(♂); between Boulemane and Midelt 11.VII.1965, Descamps (♀); Aïn el Ibel (♀) (MNHN).

E. sitifensis is a very peculiar species. It is large and characterized by an evident pronotal crest, a compressed median keel, three incomplete keels on the paranota (similar to those of *E. maroccanus*, but more evident), and abdominal keels from the metanotum to the last tergites (fig. 19). The inner border of the hind femurs bears 5–7 evident spines, which are not found in other species. The genitalia are also peculiar; dorsally they have two long digitiform processes, which extend from the base of the apical lobes, but do not reach their apex (figs. 85–87). *E. sitifensis* has a spring-early summer phenology. It is the sole species in a wide area that covers all the Maghreb, from Tunisia through Algeria to Est Morocco (Defaut 1987b; La Greca 1993).

Genus *Paraeuryparyphes* La Greca 1993

This genus is easily separated from *Euryparyphes* and related genera based on the following characteristics:

Table 1. Biometrics of species of the genus *Euryparyphes* and *Paraeuryparyphes*. Total length has been measured from the vertex to the apex of hind femurs. Sample size (x/y = males/females) is indicated in parentheses in the first column. Values (in mm) are means \pm SD.

| Species (N ♂/N ♀) | Total length | | Length of pronotum | | Height of pronotum | | Length/height of pronotum | | Length of hind femurs | | Height of hind femurs | |
|---|----------------|----------------|--------------------|----------------|--------------------|----------------|---------------------------|----------------|-----------------------|----------------|-----------------------|----------------|
| | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ |
| <i>E. bolivari</i> (8/10) | 32.6 \pm 1.6 | 49.2 \pm 3.4 | 9.9 \pm 0.6 | 16.6 \pm 1.3 | 8.5 \pm 0.2 | 15.0 \pm 1.3 | 1.2 \pm 0.04 | 1.1 \pm 0.05 | 15.6 \pm 0.72 | 22.4 \pm 2.0 | 4.9 \pm 0.3 | 6.5 \pm 0.5 |
| <i>E. gharbensis</i> (10/13) | 30.7 \pm 2.2 | 39.9 \pm 2.3 | 9.6 \pm 0.7 | 13.2 \pm 0.8 | 8.2 \pm 0.7 | 12.5 \pm 0.8 | 1.2 \pm 0.04 | 1.1 \pm 0.04 | 13.8 \pm 1.0 | 17.6 \pm 1.6 | 4.6 \pm 0.3 | 6.0 \pm 0.3 |
| <i>E. defauti</i> holotype, allotype | 26.5 | 33.5 | 8.4 | 10.6 | 7.4 | 10.3 | 1.1 | 1.1 | 12.2 | 15.8 | 4.1 | 5.4 |
| <i>E. tazzekensis</i> (9/9) | 28.2 \pm 1.1 | 40.1 \pm 1.8 | 8.9 \pm 0.4 | 12.8 \pm 0.7 | 7.6 \pm 0.3 | 12.9 \pm 0.6 | 1.0 \pm 0.04 | 1.0 \pm 0.04 | 13.4 \pm 0.4 | 17.9 \pm 0.6 | 4.3 \pm 0.2 | 6.1 \pm 0.3 |
| <i>E. laetus</i> (28/31) | 27.6 \pm 1.6 | 38.6 \pm 2.3 | 8.2 \pm 0.6 | 12.0 \pm 0.9 | 7.3 \pm 0.5 | 11.9 \pm 0.8 | 1.1 \pm 0.04 | 1.0 \pm 0.03 | 13.0 \pm 1.0 | 17.6 \pm 1.4 | 4.5 \pm 0.3 | 5.9 \pm 0.5 |
| <i>E. mamorensis</i> holotype, allotype | 24 | 33.5 | 7.7 | 11.3 | 6.3 | 10.5 | 1.2 | 1.1 | 11.1 | 15.0 | 4.0 | 5.0 |
| <i>E. terrulentus</i> (15/11) | 26.6 \pm 1.3 | 36.9 \pm 3.7 | 8.3 \pm 0.5 | 11.5 \pm 1.1 | 7.2 \pm 0.4 | 10.9 \pm 0.9 | 1.2 \pm 0.05 | 1.0 \pm 0.04 | 12.3 \pm 0.94 | 16.4 \pm 1.5 | 4.2 \pm 0.4 | 5.5 \pm 0.5 |
| <i>E. flexuosus</i> (27/25) | 25.7 \pm 1.5 | 31.4 \pm 2.6 | 8.0 \pm 0.58 | 10.0 \pm 0.8 | 7.0 \pm 0.4 | 10.5 \pm 1.0 | 1.2 \pm 0.06 | 0.9 \pm 0.03 | 12.1 \pm 0.72 | 14.5 \pm 1.6 | 4.3 \pm 0.29 | 5.2 \pm 0.4 |
| <i>E. maroccanus</i> (16/25) | 27.2 \pm 3.2 | 39.9 \pm 3.9 | 7.8 \pm 1.4 | 12.3 \pm 2.4 | 6.5 \pm 1.0 | 11.6 \pm 2.3 | 1.2 \pm 0.04 | 1.1 \pm 0.1 | 12.0 \pm 0.28 | 17.3 \pm 2.5 | 4.2 \pm 0.14 | 5.6 \pm 0.7 |
| <i>E. cinerascens</i> holotype, allotype | 25 | 35 | 6.6 | 11.2 | 7.0 | 11.4 | 0.9 | 1.0 | 10.6 | 15.5 | 4.0 | 5.6 |
| <i>E. pictipes</i> (25/27) | 23.8 \pm 1.5 | 31.7 \pm 2.4 | 7.3 \pm 0.5 | 9.2 \pm 0.5 | 6.3 \pm 0.4 | 8.8 \pm 0.5 | 1.2 \pm 0.05 | 1.0 \pm 0.04 | 10.3 \pm 0.3 | 13.2 \pm 0.7 | 4.0 \pm 0.2 | 4.9 \pm 0.3 |
| <i>E. atlasicus</i> (2/2) | 22.0 \pm 1.4 | 29.5 \pm 2.1 | 5.8 \pm 0.3 | 8.7 \pm 0.6 | 5.6 \pm 0.3 | 8.3 \pm 0.6 | 1.0 \pm 0.0 | 0.9 \pm 0.0 | 9.8 \pm 0.1 | 13.3 \pm 0.1 | 3.5 \pm 0.1 | 4.4 \pm 0.1 |
| <i>E. nigripes</i> (2/2) | 22.0 \pm 1.4 | 26.5 \pm 0.7 | 5.8 \pm 0.1 | 7.1 \pm 0.2 | 5.5 \pm 0.1 | 6.5 \pm 0.4 | 1.1 \pm 0.0 | 1.1 \pm 0.04 | 10.6 \pm 0.4 | 11.6 \pm 0.1 | 3.6 \pm 0.1 | 3.9 \pm 0.1 |
| <i>E. breviphallus</i> (2/2) | 20.0 \pm 1.4 | 26.0 \pm 1.4 | 5.8 \pm 0.3 | 6.6 \pm 0.1 | 5.4 \pm 0.2 | 6.4 \pm 0.1 | 1.1 \pm 0.01 | 1.0 \pm 0.01 | 9.6 \pm 0.1 | 11.6 \pm 0.2 | 3.6 \pm 0.1 | 3.9 \pm 0.1 |
| <i>E. sitifensis</i> (34/46) | 34.0 \pm 2.2 | 43.3 \pm 2.0 | 9.6 \pm 1.4 | 12.2 \pm 0.7 | 7.6 \pm 1.0 | 10.6 \pm 0.2 | 1.3 \pm 0.03 | 1.1 \pm 0.1 | 15.0 \pm 1.0 | 19.4 \pm 0.7 | 5.0 \pm 0.7 | 5.7 \pm 0.05 |
| <i>P. quadridentatus</i> (27/42) | 28.4 \pm 1.2 | 37.1 \pm 3.7 | 9.0 \pm 0.8 | 11.7 \pm 3.6 | 7.3 \pm 0.5 | 10.0 \pm 0.9 | 1.3 \pm 0.06 | 1.2 \pm 0.1 | 13.3 \pm 0.7 | 16.6 \pm 1.5 | 3.9 \pm 0.1 | 4.6 \pm 0.3 |

the shape of the pronotum, very highly festooned and callused and which has some spines on the upper hind margins; the presence of a remarkable keel along the whole abdomen, with a very long spine on the first three tergites (fig. 25); the prosternal process with four spines; the presence on the small tegmina of a network of veinlets (these are absent in *Euryparyphes* and *Paraeumigus*); and the unique shape of the aedeagus valves (La Greca 1993). Additionally, males have a tooth at the base of the subgenital plate, housing the phallic complex. The sole known species is *P. quadridentatus* (Brisout 1852) (= *Eunapius numida* Saussure 1887), which lives in North Africa, from East Morocco to West Libya (Tripolitania) (La Greca 1993; Massa 2009). It has a summer phenology, and most specimens have been collected in June-July.

Paraeuryparyphes quadridentatus (Brisout 1852)

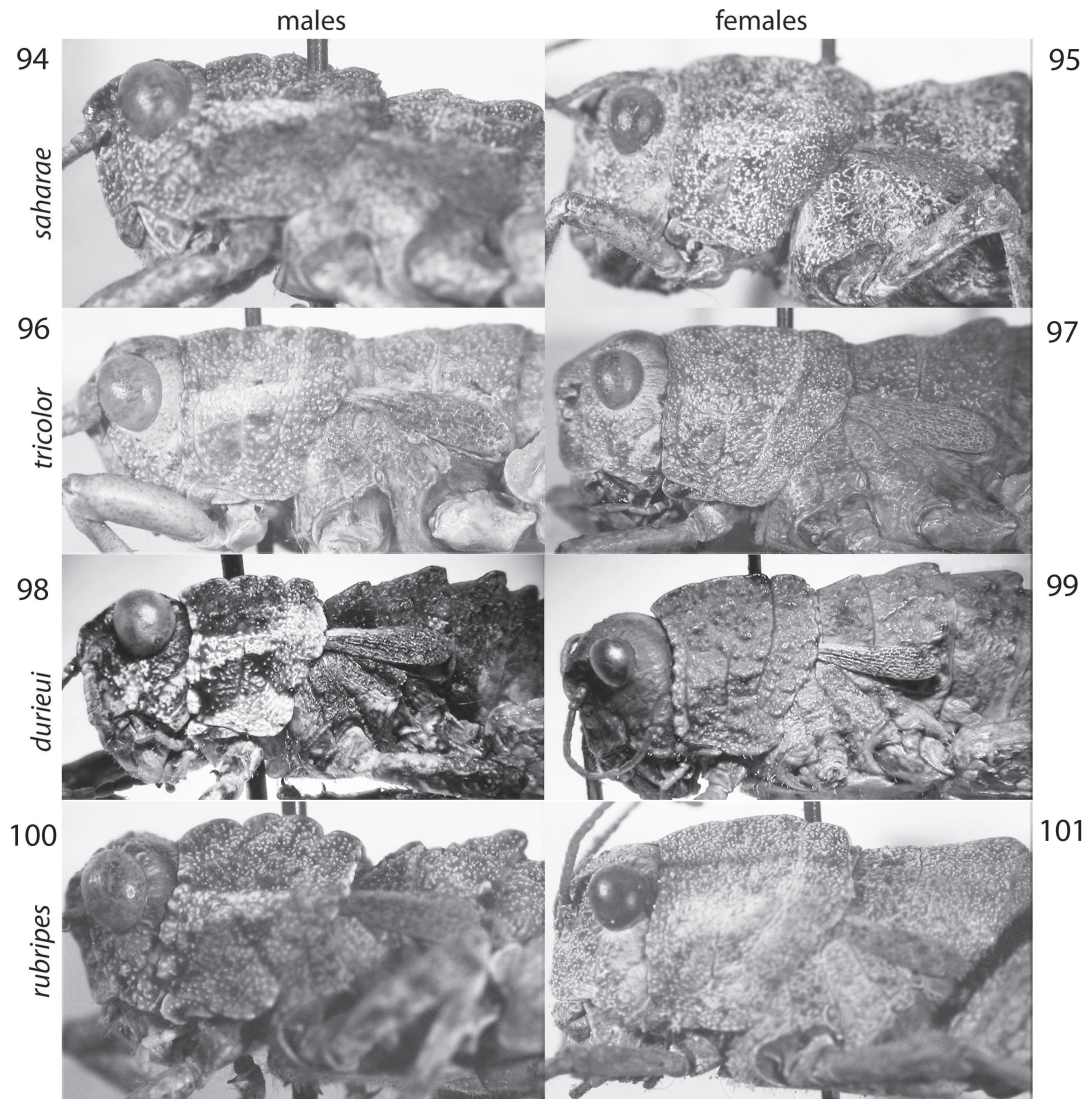
= *Eunapius numida* Saussure 1887

Material examined. Tunisia: Bir Arrach (1♂, 2♀♀); Sfax (♀ type of *E. numida*) Algeria: Hodna, ain Raniou (♀); Djelfa (2♀♀); Sfai (Atlas Saharien) (♀); Bou Saada (♀); Slissen (Oran), Tadjmut 8.VI.1952 (♂); Bouira-Sahary, Zemzache-Tarhiara 25.V.1953 (♂); Mecheria (♂♀); Morocco: Ben Tumi (Ben Yeto) (♂); Nahirija 5.V.1960, Rungs (♂); Ain Dehaguena 2.V.1961 (♂); Barbar (6♂♂, 5♀♀); Chabet el Hamra, Nadora (♀); Recifa (♀); Ain Atchana (1♂, 2♀♀); O' Zriga (♀); Ain Abaia (♀); Ain Anech (♀); Missouri (1♂, 3♀♀); Gada Debdou (2♂♂, 9♀♀); above Midelt (4♀♀); Meksem el Hamar (3♂♂, 3♀♀); between Boulemane and Midelt (7♂♂, 3♀♀) (MNH).

Key to species of *Euryparyphes* and *Paraeuryparyphes*

1. Prosternal process with 4 protruding teeth, median keel of pronotum very raised, hind border of pronotum very festooned, abdomen provided with a dentiform keel *Paraeuryparyphes quadridentatus* (Brisout 1852)
- Prosternal process with 2 protruding teeth or with 4 weak teeth or cubic. Abdominal keel absent or slightly raised 2
2. Prosternal process transverse, bi-toothed, pronotum laterally compressed. Median keel of pronotum raised and convex. Lower keel of hind femurs without spines. Outer spines of hind tibiae yellow or whitish, apically black or black-reddish 3
- Prosternal process more or less cubic, transverse or 4-toothed, with fore teeth always smaller than hind teeth. Pronotum hardly dorsally depressed, median keel of pronotum low, straight or slightly convex. Lower keel of hind femurs with apical spines 6
3. Median keel of pronotum not interrupted by transverse sulcus, very compressed and raised. Antennal segments longer than large. Large size (table 1)

- *Euryparyphes bolivari* (Stål 1876)
- Median keel of pronotum interrupted by transverse sulcus, compressed or not, raised or straight. Antennal segments as long as large (with the exception of central segments). Size variable 4
4. Median keel of pronotum compressed and raised, hind borders of pronotum festooned 5
- Median keel of pronotum straight, lateral keels evident 11
5. Ratio length/height of tegmen <2.0 6
- Ratio length/height of tegmen >2.0, lateral keels of pronotum callused 8
6. Pronotum enlarged in the metazona. Species of medium size (table 1) *Euryparyphes defauti* La Greca 1993
- Pronotum not particularly enlarged in the metazona. Species of large size (table 1) 7
7. Vertex, in lateral view slightly protruding, not sloping (mainly in females). Base of inner side of hind femurs reddish or red, bluish at the apex, sometimes red or blue. Hind tibiae black *Euryparyphes gharbensis* Defaut 1987
- Vertex, in lateral view, sloping forwards (mainly in females). Hind femurs ochreous or reddish, tibiae reddish or black *Euryparyphes tazekensis* La Greca 1993
8. Median keel of pronotum nearly straight in males, slightly raised in females, hind border of the pronotum protruding with subacute angle *Euryparyphes mamorensis* Defaut 1987
- Median keel of pronotum raised in both sexes. 9
9. Pronotum enlarged posteriorly 10
- Pronotum not enlarged posteriorly. Inner spines of hind tibiae yellow with apical black ring *Euryparyphes terrulentus* (Serville 1838)
10. Inner spines of hind tibiae black with pre-apical yellow or red ring *Euryparyphes flexuosus* Uvarov 1927
- Inner spines of hind tibiae black *Euryparyphes laetus* (Bolivar 1907).
11. Species of larger size (table 1), median and lateral keels much evident 14
- Species of small size (table 1), pronotum flat, lateral keels not evident 12
12. Brown stripe in the light dorsal area of tegmina absent, fore border of pronotum straight, hind border cut 13
- Brown stripe in the light dorsal area of tegmina present. Hind femurs and tibiae brown-blackish *Euryparyphes breviphallus* La Greca 1993
13. Pronotum, not tuberculated or wrinkled. Hind femurs yellow-ochreous, tibiae ochreous or pinkish *Euryparyphes atlasicus* La Greca 1993
- Pronotum with scarce black tubercles, also present in the metanotum and the first tergite. Hind femurs brown-blackish, tibiae blackish *Euryparyphes nigripes* La Greca 1993

**Figures 94–101**

94, *Glauia saharae* male paratype from Amane Ait Oussa (Morocco) (MNHN); **95**, *G. saharae* female paratype from Amane Ait Oussa (Morocco) (MNHN); **96**, *G. tricolor* male paratype from Foun el Hass (Morocco) (MNHN); **97**, *G. tricolor* female paratype from Ouidgane (Morocco) (MNHN); **98**, *G. durieui* male from Sidi Ifni (Morocco) (BMCP); **99**, *G. durieui* female from Gourizim-Tiznit (Morocco) (BMCP); **100**, *G. durieui rubripes* (= *G. durieui*) male paratype from Agadir (Morocco) (MNHN); **101**, *G. durieui rubripes* (= *G. durieui*) female paratype from Agadir (Morocco) (MNHN).

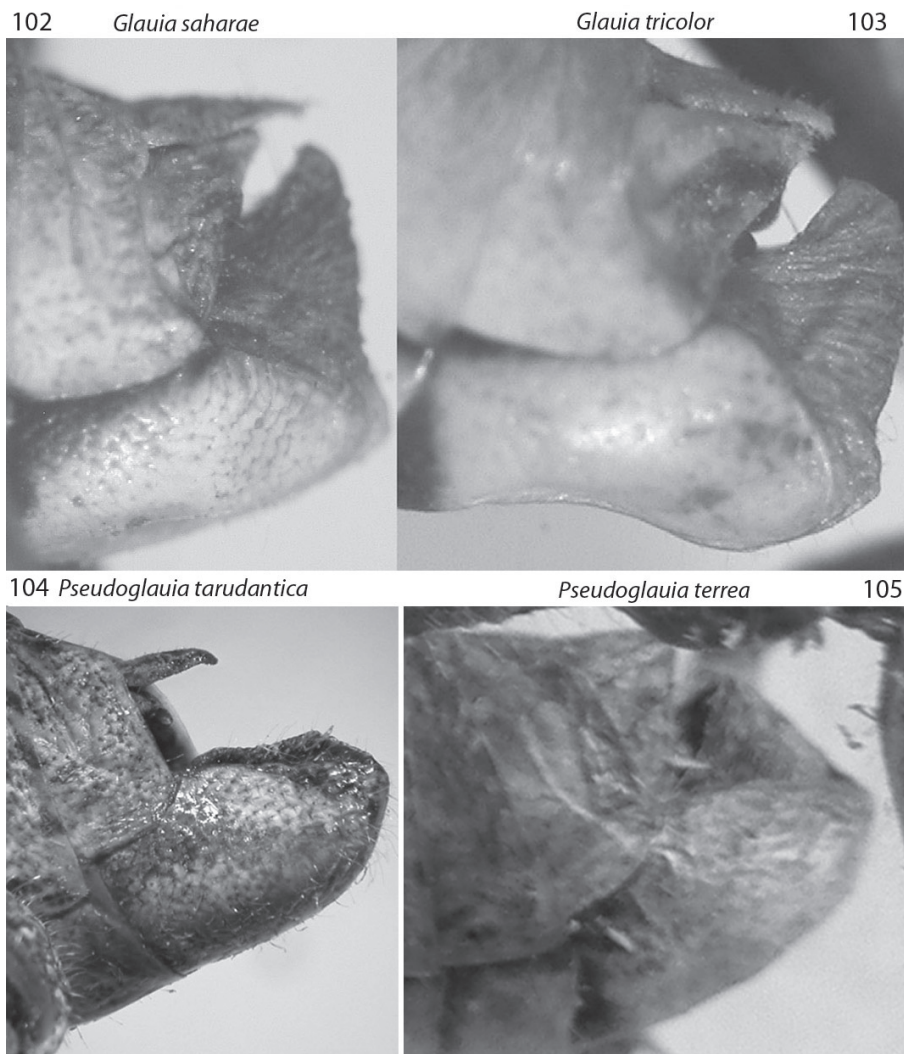
Table 2. Biometrics of taxa of the genus *Glauia*. Total length has been measured from the vertex to the apex of hind femurs. Sample size (x/y = males/females) is indicated in parentheses in the first column. Values (in mm) are means \pm SD.

| Species (N ♂/N ♀) | Total length | | Length of pronotum | | Height of pronotum | | Length/height of pronotum | | Length of hind femurs | | Height of hind femurs | |
|---------------------------|----------------|----------------|--------------------|---------------|--------------------|---------------|---------------------------|----------------|-----------------------|----------------|-----------------------|---------------|
| | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ |
| <i>saharae</i> (19/16) | 16.8 \pm 1.7 | 23.4 \pm 1.3 | 3.5 \pm 0.5 | 5.7 \pm 0.3 | 3.8 \pm 0.5 | 6.3 \pm 0.4 | 0.9 \pm 0.02 | 0.9 \pm 0.01 | 7.4 \pm 1.0 | 9.8 \pm 0.5 | 2.6 \pm 0.4 | 3.4 \pm 0.3 |
| <i>tricolor</i> (6/6) | 19.6 \pm 1.4 | 28.5 \pm 2.5 | 4.6 \pm 0.1 | 6.9 \pm 0.6 | 4.6 \pm 0.2 | 7.6 \pm 0.7 | 1.0 \pm 0.1 | 0.9 \pm 0.03 | 9.3 \pm 0.5 | 11.8 \pm 1.5 | 3.1 \pm 0.1 | 3.9 \pm 0.3 |
| <i>durieui</i> (8/8) | 16.3 \pm 1.3 | 24.6 \pm 2.5 | 3.8 \pm 0.4 | 6.2 \pm 0.7 | 4.2 \pm 0.4 | 7.1 \pm 0.9 | 0.9 \pm 0.02 | 0.9 \pm 0.01 | 7.8 \pm 0.9 | 10.8 \pm 1.3 | 2.8 \pm 0.3 | 3.8 \pm 0.4 |
| <i>rubripes</i> (5/5) | 16.8 \pm 0.7 | 25.6 \pm 1.3 | 3.9 \pm 0.2 | 6.4 \pm 0.2 | 4.5 \pm 0.3 | 7.4 \pm 0.3 | 0.9 \pm 0.01 | 0.9 \pm 0.03 | 7.6 \pm 0.4 | 11.0 \pm 0.6 | 3.1 \pm 0.2 | 3.6 \pm 0.2 |

14. Species of larger size (table 1), with evident pronotal crest, median keel compressed and three incomplete keels on paranota. Inner border of hind femurs with 4–5 evident spines .. *Euryaryphes sitifensis* (Brisout 1854)
- Species of smaller size (table 1), pronotum callused and wrinkled, keels less evident than previous species 15
15. Ratio length/height of tegmen >2.0 in males. Pronotum enlarged in the metazona and median keel stout. Brown stripe in the light dorsal area of tegmina generally absent (but is present in the holotype). Hind femurs orange or brown-blackish, tibiae red, inner spines of hind tibiae red with black base and apex. *Euryaryphes pictipes* Uvarov 1927
- Ratio length/height of tegmen <2.0 in males. Pronotum regular or just enlarged in metazona, inner spines of hind tibiae yellow with blackish apex 16
16. Pronotum regular. Upper border of tegmina in most specimens brownish. Hind femurs light, inner and upper sides of hind tibiae reddish or ochreous. *Euryaryphes maroccanus* (Saussure 1887)
- Pronotum slightly enlarged in metazona, median keel not distinctly furrowed longitudinally. Brown stripe in the light dorsal area of tegmina absent. *Euryaryphes cinerascens* La Greca 1993

Genus *Glauia* Bolivar 1912

Morales Agacino & Descamps (1968) established that this genus includes two species, *G. durieui* (Bolivar 1878) (= *G. rungsi* Chopard 1945) and *G. saharae* Morales Agacino & Descamps 1968, each of which is represented by two subspecies. The main characters



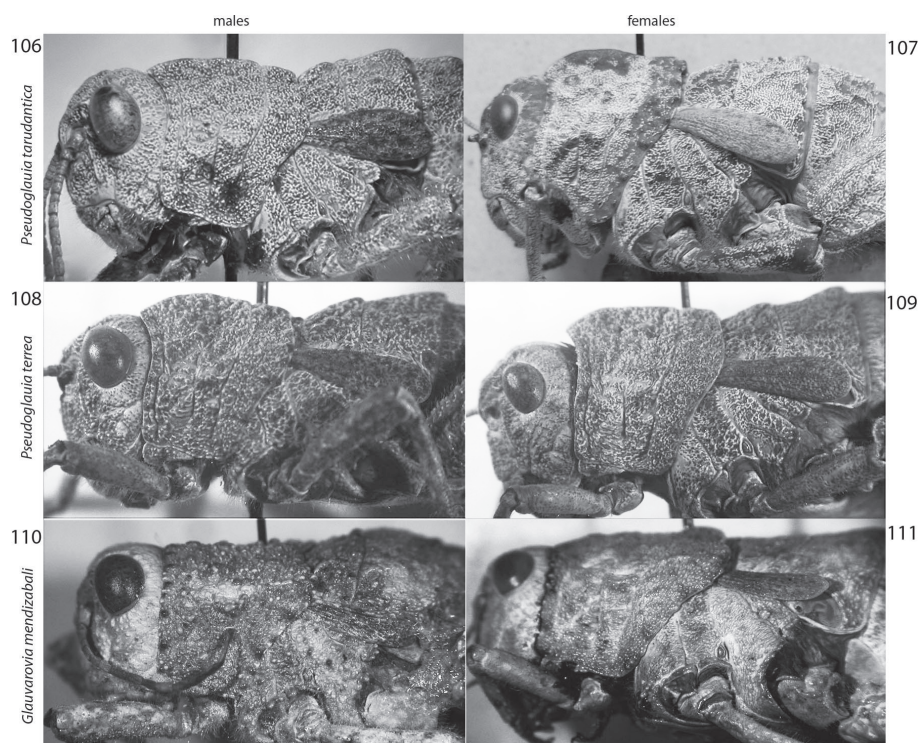
Figures 102–105

102, Subgenital plate of male of *Glauia saharae* paratype from Amane Ait Oussa (Morocco) (MNHN); **103**, Subgenital plate of male of *G. tricolor* paratype from Foum El Hass (Morocco) (MNHN); **104**, Subgenital plate of male of *Pseudoglauiia tarudantica* from Anamnar (Morocco) (BMCP); **105**, Subgenital plate of male of *P. terrea* from Glaoua n' Zlane (Morocco) (MNHN).

that separate *G. durieui* from *G. saharae* are the ratio between the length of the eye and the interocular space (σ of *G. durieui* 1.1–1.6, σ of *G. saharae* 1.6–2.1; φ of *G. durieui* 0.8–1.0, φ of *G. saharae* 1.1–1.3); the presence of an evident abdominal keel in the σ of *G. durieui*, which is absent in *G. saharae*; and differences in the shape of the φ spermatheca. Differences between the two subspecies of *G. durieui* (*durieui* and *rubripes* Morales Agacino & Descamps 1968) and two subspecies of *G. saharae* (*saharae* and *tricolor* Morales Agacino & Descamps 1968) lie in the colour of the hind legs. In subspecies *durieui* the hind tibiae have a blue base and yellow apex, the inner side of the hind tarsi is yellow, and the inner lower side of hind femurs is brown-black. In subspecies *rubripes* the inner side of the hind tibiae and tarsi, as well as the inner lower side of the hind femurs are red. In subspecies *saharae* the inner side of the hind tarsi is yellow, the inner lower side of the hind femurs is ochreous. In subspecies *tricolor* the inner side of the hind tarsi is red, the inner lower side of the hind femurs is brown-black.

Based on the material that I studied, which included all specimens listed by Morales Agacino & Descamps (1968) and Descamps (1970), I could not

distinguish between specimens of the two subspecies of *G. durieui*; in some cases males had colour patterns of one subspecies, but females had the colour patterns of the other subspecies (figs. 98–101). I was unable to find other characters to separate the subspecies of this taxon. The biometrics of the two subspecies are also very similar (table 2). When Morales Agacino & Descamps (1968) described the subspecies of *G. durieui*, they also pointed out that the distribution of the two subspecies overlaps. Fig. 112 reports all the localities listed below. It is evident that the distributions of the subspecies of *G. durieui* overlap and that these subspecies are taxonomically invalid. I consider *Glauia durieui rubripes* Morales Agacino & Descamps 1968 = *Glauia durieui durieui* (Bolivar 1878). Concerning *Glauia saharae*, I found that the profile of the pronotum of *tricolor* in lateral view is less undulate and more straight than in *saharae* (compare figs. 94–95 with 96–97) and that *tricolor* is larger than *saharae* (table 2); consequently the ratio length/height of the pronotum is greater in *tricolor* than in *saharae*. In addition, the shape of the last sternite differs between these taxa (figs. 102–103). Considering the overlap in the distribution of *saharae* and *tricolor*, I think that they should be considered



Figures 106–111

106, *Pseudoglaucia tarudantica* male from Anamnar (Morocco) (BMCP); **107**, *P. tarudantica* female from Tarudant-Asni (Morocco) (MNHN); **108**, *P. terrea* male from Glaoua n' Zlane (Morocco) (MNHN); **109**, *P. terrea* female from Glaoua n' Zlane (Morocco) (MNHN); **110**, *Glauvarovia mendizabali* male from Foun Draa (Morocco) (MNHN); **111**, *G. mendizabali* female from El Aioun du Draa (Morocco) (MNHN).

as valid species. As a consequence, South Morocco contains three species of *Glauia*: *durieui*, *saharae* and *tricolor*.

Glauia saharae Morales Agacino & Descamps 1968

Material examined. Morocco: Ain Guerzin 27.III.1955 (♂ holotype, ♀ allotype, 5♂♂, 3♀♀ paratypes); Amane ait Oussa 27.III.1955 (4♂♂, 2♀♀ paratypes); Tafnidilt (low Drâa) 24.III.1954 (♂♀ paratypes); Sidi Ifni IV.1934 (6♂♂, 3♀♀ paratypes); Gelb Lataris 27.III.1955 (1♂, 3♀♀ paratypes); Goulimine IV.1947 (♀ paratype); Tarfaya 8.V.1968 (♂) (MNHN); Sidi Ifni 4.III.2011, A. Corso (2♀♀) (BMCP).

Glauia tricolor Morales Agacino & Descamps 1968

Material examined. Morocco: Fom el Hassan IV.1947 (♂ holotype); Fom el Hassan, Vallée de Tamanora (3♂♂ paratypes, ♀ allotype); Mirleft 30.IV.1955 (♂ paratype); Fask 23.IV.1955 (2♀♀ paratypes), 12.V.1968 (♀); Ouidgane 7.III.1958 (2♀♀ paratypes) (MNHN).

Glauia durieui (Bolívar 1878)

Material examined. Morocco: Auja (♂ holotype of *G. rungsi*, synonymised with *G. d. durieui* by Morales Agacino & Descamps 1968); Gourizim (♂); Sous id Hammouch (♂); Sous Tiznit (♂); Mirleft (♂♀); Bou Tzakarene 5.IV.1955 (4♀♀)

(MNHN); Gourizim-Tiznit 22.I.2005, H.Lopez (♀); Et-Tnine 23.I.2005, H.Lopez (2♂♂, 2♀♀); Sidi Ifni 4.III.2011, A.Corso (♂) (BMCP).

[*Glauia durieui rubripes* Morales Agacino & Descamps 1968]

= *Glauia durieui* (Bolívar 1878)

Material examined. Morocco: Sous Taroudant (♂ paratype); El Mahasser (♂ paratype); Sous Khasba Agadir (3♂♂, 4♀♀ paratypes); Sous Ait Melloui (♀ paratype) (MNHN).

Key to species

1. Ratio between length of eye and interocular space between 1.1 and 1.6 (males), 0.8 and 1.0 (females); abdominal keel of male evident; inner side of hind tarsi yellow or red; inner lower side of hind femurs brown-black or red *Glauia durieui* (Bolívar 1878)
- Ratio between length of eye and interocular space between 1.6 and 2.1 (males), 1.1 and 1.3 (females); abdominal keel absent 2
2. Lateral view of pronotum undulate, smaller size (table 2); base of last sternite of male regular
..... *Glauia saharae* Morales Agacino & Descamps 1968

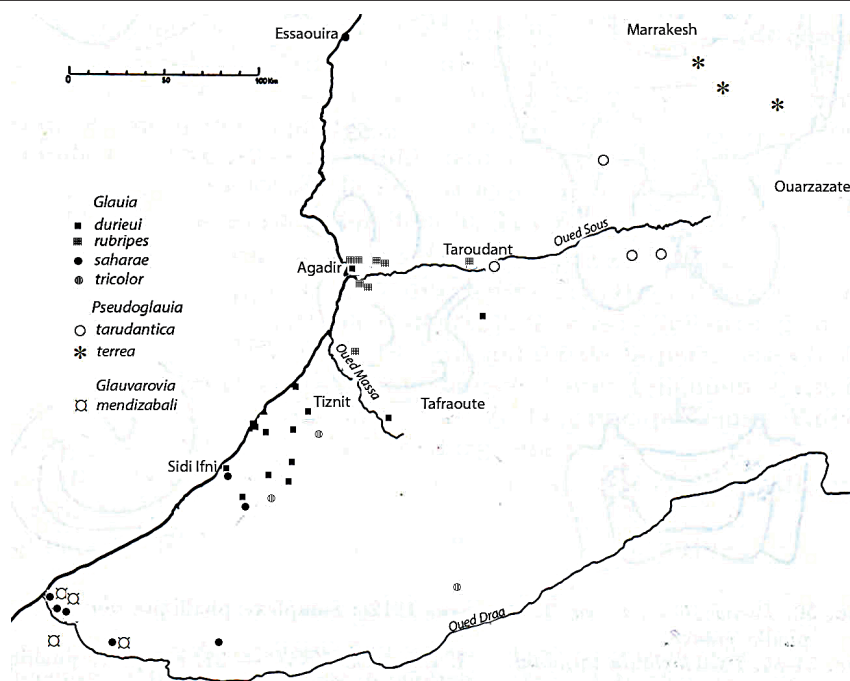


Figure 112
Known Moroccan distribution of taxa belonging to genera *Glauia*, *Pseudoglaucia*, and *Glauvarovia*.

- Lateral view of pronotum straight, larger size (table 2); base of last sternite of male concave in lateral view
..... *Glauia tricolor* Morales Agacino & Descamps 1968

Genus *Pseudoglaucia* Morales Agacino & Descamps 1968

Pseudoglaucia differs from *Glauia* in the following characteristics: *Pseudoglaucia* is larger; it has straight and laterally compressed cerci; the subgenital plate of the male is convex in lateral view; its pronotum is interrupted by only one sulcus; its arolia are smaller than the half claws; the hind border of its epiphallus is straight; and the cingulum of the penis substantially protrudes. This genus includes two species, *P. tarudantica* (Bolivar 1914) (figs. 106–107) and *P. terrea* (Bolivar 1912) (figs. 108–109), recognizable by the shape of the pronotum and of the male phallic complex. I found other small differences: the ratio between length and height of the tegmina in males is 3.2–3.3 in *P. terrea*, and 2.3–2.5 in *P. tarudantica* (females of the two species have similar ratios); additionally, the subgenital plate of the male is longer in *P. tarudantica* than in *P. terrea* (figs. 104–105). *P. tarudantica* is known only from the area between Marrakech and Ouarzazate, while *P. terrea* is known only from the area between Tarudant and Ouarzazate (fig. 112).

Pseudoglaucia terrea (Bolivar 1912)

Material examined. Morocco: Glaoua n' Zlane (Marrakech) 29.VII.1954 (6♂♂, 6♀♀) (MNHN).

Pseudoglaucia tarudantica (Bolivar 1914)

Material examined. Morocco: Tarudant-Asni (Tizi n' Test) 23.VII.1965, M.Descamps (2♀♀); Taliouine, 25.VII.1965, M.Descamps (♂) (MNHN); Anamnar (between Taliouine and Aouluz) 1.III.2011, A.Corso (♂) (BMCP).

Genus *Glauvarovia* Morales Agacino 1945

Represented by only one species, *G. mendizabali* Morales Agacino 1945, this genus is a sub-Saharan Pamphagidae, possibly endemic to the low Draa Valley (fig. 112). The genus is characteristic in the shape of its pronotum (figs. 110–111) and in having an epiphallus that is nearly as long as the entire phallic complex. In addition, this genus has two very small tegmina, that only partially cover the tympanum. *G. mendizabali* seems to be one of the rarest species of Pamphaginae of the West Palaearctic.

Glauvarovia mendizabali Morales Agacino 1945

Material examined. Morocco: Pozo Mesit 6.XI.1944 (♂); El Aioun du Draa 10.IV.1947 (♀); Tafnidilt 28.III.1954 (♂);

Foum Draa 28.III.1955 (♂); Khat Oum en Naja 5.V.1968 (♀) (MNHN).

Genus *Prionosthenus* Bolivar 1878

The genus *Prionosthenus* has a remarkable sexual dimorphism (males are ca. 40–50% smaller than females). Its distribution covers the Middle East, including Israel, Jordan, Syria and Lebanon (Fishelson 1985); its highest species diversity is in Lebanon, because of the two mountain chains in that country (the Lebanon and Anti-Lebanon Mountains) that run in a North-South direction, and that may have resulted in populations that evolved in isolation. The most recent review of Massa & Fontana (2003) overlooked a paper of Werner (1939); additionally, from 15 to 23 May 2010, I collected specimens in the Lebanon mountain chain, and found new and interesting material. Now I provide additional information on this genus and on the recently collected material.

Prionosthenus syriacus (Brisout 1855)

Material examined. Syria: Al Zabadani-Bloudan (1300 m) V.2010, C.Sola (♂♀ mating); Bloudan (1900 m) 21.V.2009 and 4.VI.2009, M.Sarovec (2♀♀) (BMCP).

Because the type area was “Syria” (which had a much wider geographical area in 1855 than today) and because the type has been lost, Massa & Fontana (2003) proposed to rescue this name from oblivion. These authors observed specimens with characteristics of this species in populations located in northern Israel and southern Lebanon, particularly on Mt. Hermon, which is part of the south-eastern chain of mountains, known as the Anti-Lebanon range or Djebel Esh Shargi, 2659 m, located between Lebanon and Syria. Male of this species is characterized by having a raised keel, that is interrupted by the typical sulcus, and by having prozona and metazona that are not clearly separated. Based on material newly collected, *P. syriacus* lives on the mountainous area near Damascus.

Prionosthenus galericulatus (Stål 1876)

Material examined. Lebanon: Sarada, Whadi Khansi (Marjayoun) 30.III.2010, L.Picciau (♂♀) (BMCP).

Distribution of this species covers also S Lebanon (Massa & Fontana 2003), where it lives at low altitudes.

Prionosthenus femoralis Werner 1938

= *P. lebanicus* Dirsh 1950

Material examined. Lebanon: Btater (Bhamdoun) 15.V.2010, B.Massa (♂♀); Bmehaya (Chouf) 16.V.2010, B.Massa (♀);

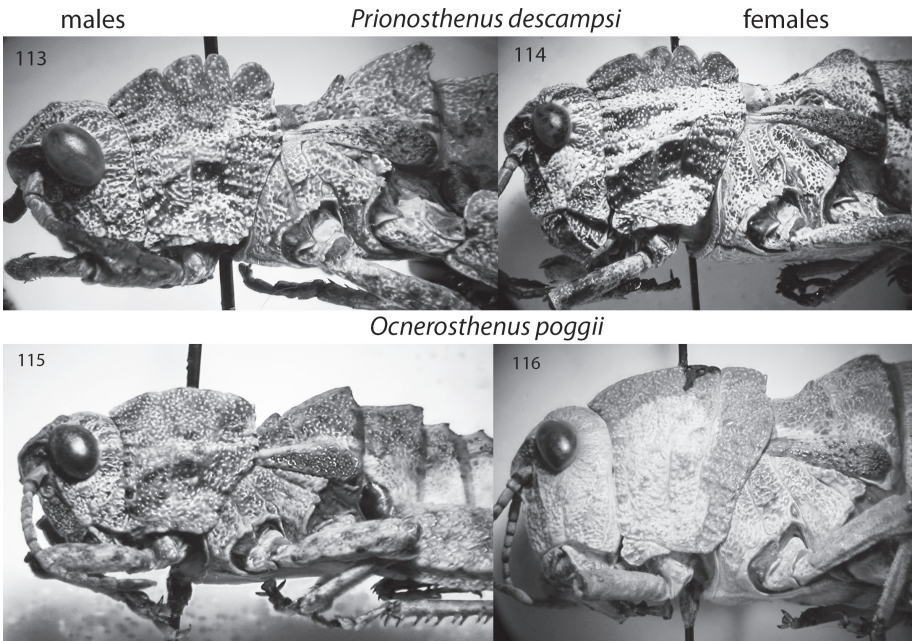
Table 3. Biometrics of *Prionosthenus descampsi* **n. sp.** Total length has been measured from the vertex to the apex of hind femurs. Sample size: 3 males, 3 females (min-max in mm).

| Total length | | Length of pronotum | | Height of pronotum | | Length of hind femurs | | Height of hind femurs | |
|--------------|-----------|--------------------|----------|--------------------|-----------|-----------------------|---------|-----------------------|---------|
| ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ |
| 25.6–27.3 | 40.0–41.0 | 5.2–5.9 | 9.2–12.0 | 6.5–7.1 | 10.6–13.0 | 10.8–11.5 | 16–17.8 | 3.2–3.8 | 4.7–5.2 |

Barouk Reserve (1800 m) 16.V.2010, B.Massa (3♂♂, 1♀); Mt Kneisse (1500 m) 17.V.2010, B.Massa (2♂♂, 3♀♀) (BMCP). See also *P. lebanicus* in Massa & Fontana (2003).

When Massa & Fontana (2003) revised the genus *Prionosthenus*, they overlooked the paper of Werner (1939) and the two species described by him. One of them, *P. femoralis*, was collected at Ain Sofar, near Aley (10 km apart), which is the type locality of *P. lebanicus* Dirsh 1950. The main characteristics reported by Werner (1939) for *P. femoralis* are: the clear presence of a keel on the pronotum of the male (the keel is less evident in the female), which is regularly raised and remarkably interrupted by the typical sulcus (mainly in the male); the abdomen laterally compressed; toothed and raised first tergites; and blue-grey tibiae. The size of this species reported by the author (♂: 29.5; ♀: 46 mm) and its characters lie within those listed by Dirsh (1950) for *P. lebanicus*: the median keel high, strongly convex, laterally compressed, and deeply and broadly dissected by third transverse sulcus; the upper margin

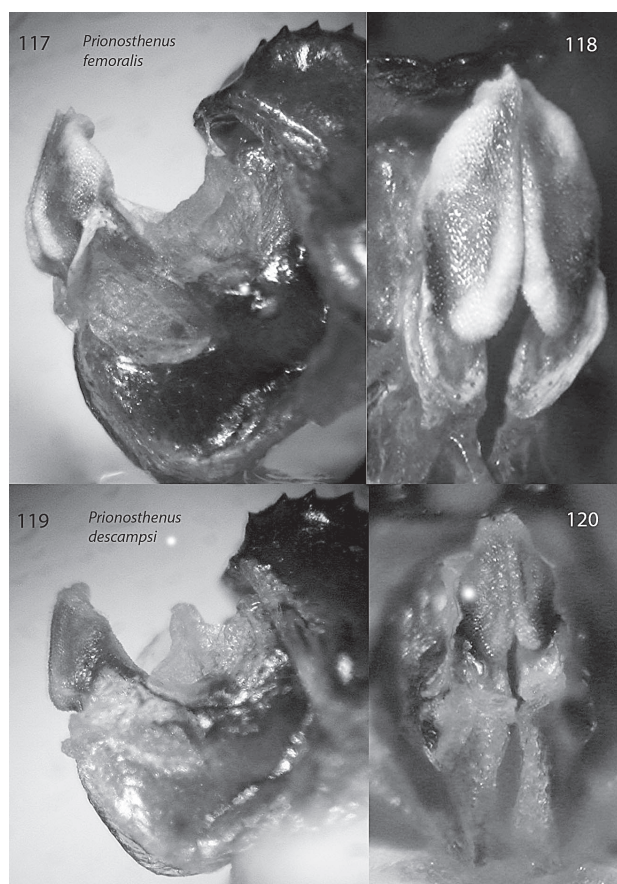
of the metanotum, in profile, irregularly curved, with a tooth-shaped projection on the posterior margin; the abdomen strongly keeled; and the hind tibiae grey above, and grey-blue inside. Dirsh (1950) was also unaware of Werner (1939), and for this reason he did not compare his species with that of Werner. Material collected by Werner should have been preserved in the NMW, but I was unable to find it during a visit in 2004 to the Vienna Museum, and it has possibly been lost. While in Lebanon in 2010 I also collected one pair of specimens from Btater, at a location exactly between Aley and Ain Sofar; the genitalia of the male are identical to those of specimens collected at Barouk Reserve, Mt. Kneisse, and Jebel Kesrouane (cf. also Massa & Fontana 2003). It seems evident that *P. femoralis* and *P. lebanicus* are the same taxon; thus, I propose the new synonymy: *Prionosthenus lebanicus* Dirsh 1950 = *Prionosthenus femoralis* Werner 1939. The range of this species should include the central-southern Lebanon mountain chain.



Figures 113–116
113, *Prionosthenus descampsi* **n.sp.** holotype male; **114,** *P. descampsi* **n.sp.** allotype female; **115,** *Ocnerosthenus poggii* **n.sp.** holotype male; *O. poggii* **n.sp.** allotype female (all BMCP).

Prionosthenus baalbekianus Werner 1938

Characteristics are less clear for *P. baalbekianus* than for *P. femoralis*; in particular, Werner (1939) wrote that only half of the tympanum in *P. baalbekianus* is covered by the tegmen, which is unusual for *Prionosthenus* and related genera. Because the pair of specimens listed by Werner (1939) seems to have been lost, it is impossible to establish whether this is a valid taxon; from the type locality (Baalbeck, Lebanon), Massa & Fontana (2007) recorded *Ocnerosthenus simulans* (Bolivar 1911), but because Werner (1939) described the pronotum of the *P. baalbekianus* male as being clearly interrupted by the typical sulcus, a character which is not much evident in *O. simulans*, *P. baalbekianus* remains a *taxon inquirendum*.



Figures 117–120

117, Lateral view of the phallic complex of *Prionosthenus femoralis* from Mt. Kneisse (Lebanon); **118**, Ventral view of aedeagus sclerites of the same; **119**, Lateral view of the phallic complex of *P. descampsi* holotype; **120**, Ventral view of aedeagus sclerites of the same (all BMCP).

Prionosthenus descampsi n. sp.

Material examined. Lebanon: Yammoune (34°07'24"N 36°02'28"E, 1450 m) 18.V.2010, B.Massa (1♂ holotypus, 1♀ allotypus, 1♀ paratypus); Ainata (1700 m) 18.V.2010, B.Massa (♂ paratypus) (BMCP); Yammoune VI.1893, E.Festa (♀ paratypus); Merdsch Ain VI.1893, E.Festa (♂ paratypus) (MSNT).

Among the many specimens collected in Lebanon in May 2010, I found within an area of central-north Lebanon, between the villages of Yammoune and Ainata, a small number of a distinctive species that did not correspond to any described species. In addition, I found two more specimens bearing the same characteristics in the coll. Festa (MSNT).

It is a species of small size (table 3). The frontal ridge is moderately projected forwards and compressed. The fastigium of the vertex is elongate, concave, and limited by straight lateral carinulae. The antennae are 12–13 segmented (in this genus, two segments are often fused), are shorter than the head and the pronotum together, and are thick and compressed. The median keel is moderately high and raised, convex, undulate and laterally compressed, and is deeply and broadly interrupted by three sulci (figs. 113–114). In lateral view, the upper margin of the metanotum is irregularly curved, with a very small tooth projection on the posterior margin. The abdomen is moderately (for the genus) carinate in the male, and slightly carinate in the female. The mesosternal interspace is as long as broad, and the metasternal interspace is as long as broad in the male, but twice as wide as long in the female. The Krauss's organ is smooth, and is black in the male, and white in the female. The prosternal process has a fore concave collar and some small hind tubercles, that may merge in two collars. The phallic complex, in lateral view, has short bottle-shaped sclerites (fig. 119), which, from the back view, are stout and rhomboidal (fig. 120).

The inner side of the hind femurs is blackish from the base to ca. two-thirds of its length in the male, or grey from the base to half of its length in the female. The upper side of the hind tibiae is black or grey-blue, and the spines are grey with a black apex.

Derivatio nominis. I name this species after the late French orthopterologist Marius Descamps, who contributed greatly to the knowledge of Palaearctic Pamphagidae; I am particularly obliged to him for encouraging my study of the species of this family.

Distribution. Localities where specimens were collected are within valleys in the Lebanon chain, not far from Cedars; they were visited by E. Festa on 25–26 June 1893 (Festa 1894), who described the area as very rich in water and with fertile soils; the mountains surrounding the area were once covered by abundant forests of cedars, that are largely disappeared by 1893. Only a small number of single trees currently remains; below one of them, I found one of the specimens here listed.

Affinities. The new species is a medium-sized species representative of the genus *Prionosthenus* (see Massa & Fontana 2003). It differs from other species in this genus by the shape and size of its pronotum, and by its

aedeagus sclerites. The most closely related species is *P. femoralis* (= *P. lebanicus*), whose main characteristics are the pronotum keel interrupted by one sulcus, with prozona well divided from metazona, and the aedeagus sclerites clearly keeled and more robust than in *P. descampsi* (compare figs. 119–120 with 117–118).

Key to species
(after Massa & Fontana 2003, modified; *P. baalbekianus* is not included)

1. Species of small size, with body of male laterally very compressed, fastigium very protruding, prozona much higher than metazona and abdomen with a raised keel; aedeagus sclerites stout and short, ending with four flat tips. North Jordan, central-north Israel and south-western Lebanon (only small altitudes) *Prionosthenus galericulatus* (Stål 1876)
- Species of large size, body less laterally compressed, fastigium less protruding, prozona slightly higher than metazona, or regularly raised, or undulate, abdomen keeled, with shorter tergite spines 2
2. Pronotum undulate and divided by 2–3 sulci; aedeagus sclerites short and from back view enlarged at the center. Central Lebanon (area between Yammoune and Ainata) *Prionosthenus descampsi* n. sp.
- Pronotum more or less regularly raised, divided only by the typical sulcus 3
3. Pronotum not much raised, males and females with prozona and metazona slightly divided by the typical sulcus; aedeagus sclerites stout in lateral view and slender from back view. North Israel, south Lebanon and Syria (mountains near Damascus) *Prionosthenus syriacus* (Brisout 1855)
- Pronotum raised and clearly divided in prozona and metazona by the typical sulcus (less in females) 4
4. Smaller size (total length from the vertex to the apex of hind femurs: males 24–26, females 40–44 mm); aedeagus sclerites slender and keeled in lateral view, bottle shaped from back view. Central-south Lebanon (from Kesrouane to Barouk) *Prionosthenus femoralis* Werner 1939
- Larger size (total length from the vertex to the apex of hind femurs: males 27–31, females 42–47 mm); aedeagus sclerites with pointed apices. South Turkey ... *Prionosthenus guleni* Karabag 1956

Genus *Prionosthenus* Subgenus *Lativertex*
Koçak & Kemal 2011

In revising the genus *Prionosthenus* Bolivar 1878, Werner (1939) described the subgenus *Lativertex*; he provided some characters of the subgenus within a key to species (of both subgenera) and a short diagnosis. *Lativertex* is characterized by the very large fastigium, with obtuse fore angle, and a prosternal process without tubercles (see also Fig. 8 of Werner 1939). Within the

characters of the key, Werner divided the species of the subgenus *Lativertex* into two groups. The first group comprises only the species *P. liebmanni*, which is a large and squamipterous species from Palestine. The second includes two species (only females studied by Werner), *iranicus* and *keredjensis*, both from the same locality of Iran (Keredj, 40 km west of Teheran); these are characterized by their small size, the pronotum not interrupted by sulcus, and the complete absence of tegmina. It seems evident that *Lativertex* is not a subgenus of *Prionosthenus* (whose species are squamipterous); concerning the species *keredjensis*, Ramme (1951) established that it belongs to one of the apterous Pamphaginae distributed in Central Asia, namely to the genus *Nocarodes* Fischer von Waldheim 1846. I consider that *iranicus* also belongs to the same genus; in fact, when fig. 8 of Werner (1939) is compared with females of a species of *Nocarodes*, which have a low pronotum keel, ovipositor valves well protruding, and hind femurs with their upper border substantially protruding, it seems clear that *Lativertex* is a synonym of *Nocarodes*.

According to art. 13.3 of the ICZN “every new genus-group published after 1930 must be accompanied by the fixation of a type-species in the original publication”. For this reason, Koçak & Kemal (2010) re-described *Lativertex*, by using the same words used by Werner (1939), and by designating *Prionosthenus (Lativertex) iranicus* Werner 1939 as the type species. However, even if specimens of Werner (1939) belonging to the subgenus *Lativertex* are no longer present in the NMW, I propose the following synonymy: *Prionosthenus (Lativertex)* Koçak & Kemal 2011 = *Nocarodes* Fischer von Waldheim 1846. Concerning *Prionosthenus liebmanni*, Werner (1938) described only one female collected at Rosh Pinah (Palestine); it is stout, of large size (61 mm), with a fastigium verticis larger than in other known species; characters of it should match those of *Ocneropsis bethlehemita* (Bolivar 1893), but Werner (1938) in his key distinguished species with fastigium verticis not larger than an eye (which included the latter species) from those with fastigium verticis very large (which included *P. liebmanni*). In conclusion, *P. liebmanni* remains a *taxon inquirendum*.

Genus *Ocnerosthenus* Massa 1995

This taxon is endemic to the mountains of Israel, Syria, and Lebanon, and is characterized by a remarkable sexual dimorphism (like species of the genus *Prionosthenus*, males are ca. 40–50% smaller than females). During my collecting tour in the Lebanon

Table 4. Biometrics of *Ocnerosthenus poggii* n.sp. Total length has been measured from the vertex to the apex of hind femurs. Sample size: 9 males, 4 females. Values (in mm) are means \pm SD.

| Total length | | Length of pronotum | | Height of pronotum | | Length of hind femurs | | Height of hind femurs | |
|----------------|----------------|--------------------|---------------|--------------------|----------------|-----------------------|----------------|-----------------------|---------------|
| ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ | ♂ | ♀ |
| 23.1 \pm 1.4 | 36.6 \pm 1.9 | 5.3 \pm 0.2 | 9.7 \pm 0.9 | 6.1 \pm 0.5 | 10.6 \pm 0.7 | 9.8 \pm 0.7 | 14.4 \pm 1.1 | 3.7 \pm 0.2 | 5.2 \pm 0.2 |

mountain chain in May 2010, I commonly found representatives of this taxon at high altitudes. Thus, even though a recent review (Massa & Fontana 2007) is available, it will be useful to describe the newly collected material.

Ocnerosthenus verrucosus (Brunner von Wattenwyl 1882)

Material examined. Syria: Al Zabadani-Bloudan (1300 m) V.2010, C. Sola (♀); Lebanon: Mt Kneisse (1800 m) 17.V.2010 (7♂♂, 6♀♀) (BMCP).

According to Massa (2010), this species is the only

representative of the genus *Ocnerosthenus* that inhabits the Anti-Lebanon mountain chain. Characteristics of this species have been reported by Massa & Fontana (2007) (female) and Massa (2010) (male); the aedeagus sclerites are longer than in other species, and because of their membranous consistency, apices may overlap (see Massa 2010), but appear parallel and very fine in some specimens.

Ocnerosthenus simulans (Bolivar 1911)

Material examined. Lebanon: Ainata (1700 m) 18.V.2010, B.Massa (4♂♂, 6♀♀); Tannourine Reserve (1400–1800 m) 20.V.2010, B.Massa (♂); Jebel Mekmel, Aayoun Ourgouch (2000 m) 19.V.2010, B.Massa (9♂♂, 6♀♀); Yammoune (1450 m) 18.V.2010, B.Massa (♂) (BMCP).

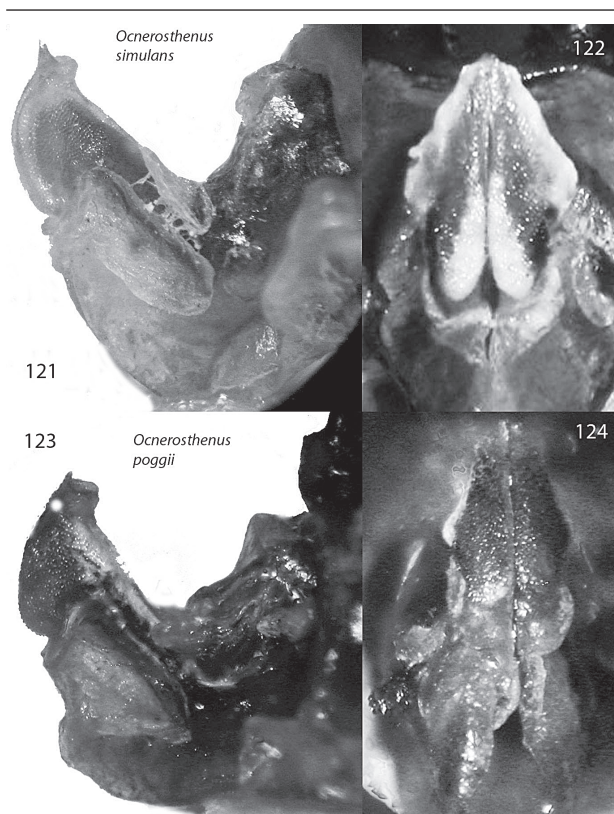
This species is characterized by having a raised pronotum, that is hardly interrupted by the typical sulcus. Localities reported above lie within the known area covered by this species, and include the central-north Lebanon mountain chain, from Tripoli to south-east up to the Beckaa Valley (cf. Massa & Fontana 2007).

Ocnerosthenus poggii n. sp.

Material examined. Lebanon: Ed Donie, Nabaa Ras en Nahr (34°22'43"N 36°06'59"E, 2200 m) 21.V.2010, B.Massa (♂ holotype, 6♂♂ paratypes, ♀ allotype, 2♀♀ paratypes); Fnaidek 22.V.2010, B.Massa (♂ paratype); Jebel Qammouaa (1800–2000 m) 21.V.2010, B.Massa (♂♀ paratype). All are preserved at BMCP, with the exception of two paratypes ♂ and ♀ from Ed Donie, preserved in the MSNG.

According to Massa (1995) and Massa & Fontana (2007), no species has been previously reported from the northernmost Lebanon mountain chain. Visiting the wonderful mountains of Ed Donie and Jebel Qammouaa, I found specimens that differed from those collected on Jebel Mekmel (identified as *O. simulans*; see above). Their characteristics indicate that they belong to an undescribed taxon, which I therein name *Ocnerosthenus poggii*.

Specimens of *O. poggii* are small (table 4). The body is not much compressed from above in the male, but is more compressed in the female. The antennae have 13 segments, and are shorter than the head and pronotum together. The pronotum keel of the male varies from slightly raised to raised, is interrupted by the typical sulcus, but lacks a clear separation of the prozona from the metazona. In the female, the pronotum keel



Figures 121–124

121, Lateral view of the phallic complex of *Ocnerosthenus simulans* from J. Mekmel (Lebanon); **122**, Ventral view of aedeagus sclerites of the same; **123**, Lateral view of the phallic complex of *O. poggii* n.sp. holotype; **124**, Ventral view of aedeagus sclerites of the same (all BMCP).

is regularly raised; the typical sulcus may or may not reach the keel, and consequently the prozona and metazona may or may not be separated. The abdomen of the male is more or less keeled (fig. 115) by central teeth, which in lateral view are not higher than the pronotum keel; the abdomen of the female has only remains of teeth on the hind central border of the tergites (fig. 116). The mesosternal space is 1.3–1.5 times wider than long in males, and 2.0 times wider than long in females; the metasternal space is 1.5–2.0 times wider than long in males, and 3.0 times wider than long in females. The Krauss's organ is smooth, black in the male, and white in the female. The prosternal process has a fore concave collar and some small hind tubercles, which may be small or large; if large, they form a second rough collar. The phallic complex, in lateral view, has stout sclerites (fig. 123), which, from back view, have a wide base, that narrows and then enlarges forming two lateral arrows; sclerites are rounded with a very fine point (fig. 124).

The inner side of the hind femurs is orange-greyish (or bluish in one female) with a black-bluish base; the inner side of the hind tibiae is bluish or black-bluish, and the inner side of knees is blackish.

Derivatio nominis. This species is dedicated to Roberto Poggi, formerly director of the Museo Civico di Storia Naturale 'G.Doria' of Genoa, who very kindly allowed me at various times to study the rich material preserved in their collections.

Affinities. The geographically nearest species to *O. poggii* is *O. simulans*, whose main characteristics are the pronotum weakly interrupted by the typical sulcus, and aedeagus sclerites that are longer and wider than in *O. poggii*, and have prominent apices (compare figs. 123–124 with 121–122).

Key to species (after Massa & Fontana 2007, modified)

1. Pronotum straight, first tergites higher than pronotum. Aedeagus sclerites from back view rounded and asymmetrical. Central Lebanon (between Beirut and the Beckaa Valley) *Ocnerosthenus kneuckeri* (Krauss 1909) 2
- Pronotum more or less raised, first tergites as high as pronotum 2
2. Pronotum keel lower in the prozona than in the metazona in males, less raised in females. Aedeagus sclerites from back view acutely pointed and basally expanded. North-eastern Syria *Ocnerosthenus brunnerianus* (Saussure 1887) 3
- Pronotum keel regularly raised 3
3. Species of large size (total length from the vertex to the apex of hind femurs: males 26–29, females 41–50 mm); aedeagus sclerites from back view straight, rounded, apically enlarged and finely pointed. North Israel and South Lebanon (Mt. Hermon) *Ocnerosthenus lividipes* (Fishelson 1985) 4
- Species of smaller size (total length from the vertex to the apex of hind femurs: males 20–26, females 35–45 mm) 4
4. Hind border of pronotum very undulate, with tubercles of different size; pronotum interrupted by one or two

sulci in males, by one sulcus in females. Aedeagus sclerites long and pointed, apically may or may not be overlapped. South Lebanon and Syria (mountains near Damascus) .. *Ocnerosthenus verrucosus* (Brunner von Wattenwyl 1882)

- Hind border of pronotum less undulate, pronotum interrupted by one sulcus in males, interrupted or not interrupted in females 5
- 5. Pronotum of the male divided by typical sulcus but prozona and metazona are not clearly separated, pronotum of the female slightly divided or not divided by typical sulcus. Aedeagus sclerites from back view with a wide base, which narrows and then enlarges, forming two lateral arrows; apices of sclerites rounded with a very fine point. North Lebanon (Ed Donie and Qammouaa mountains) *Ocnerosthenus poggii* n. sp.
- Pronotum divided by typical sulcus, which clearly separates prozona from metazona. Aedeagus sclerites from back view stout and with prominent keels, apically pointed. Central-north Lebanon (from Tripoli to south-east up to the Beckaa Valley) *Ocnerosthenus simulans* (Bolivar 1911)

Aknowledgements. I thank very much the Muséum National d'Histoire Naturelle of Paris for allowing me to photograph some specimens preserved in their collections; the editor of Accademia Gioenia di Scienze Naturali, Catania for allowing me to use some figures of the paper of La Greca (1993); and Vicenta Llorente and Juan José Presa for allowing me to use some figures of their paper of 1997. I am especially indebted to Fabrizio Rigato and Maurizio Pavesi, who allowed me to study the material of La Greca's collection preserved in the Museo Civico di Storia Naturale di Milan; and to Laure Desutter and Simon Poulain, who allowed me to examine specimens preserved in the Muséum National d'Histoire Naturelle of Paris. I also thank very much Attilio Carapezza, Andrea Corso, Gianfranco Sama, Heriberto López and Luca Picciau, who provided some specimens of Pamphagidae, Filippo M. Buzzetti and Paolo Fontana for their suggestions; and Rosa Buglisi for German translations.

References

- Chopard L. 1943.** *Faune de l'Empire Français. I. Orthoptéroïdes de l'Afrique du Nord*. Librairie Larose, Paris, 450 pp.
- Defaut B. 1987a.** Diagnoses d'Orthoptéroïdes nouveaux ou nouvellement décrits au Maroc. *L'Entomologiste* **43**: 109–112.
- Defaut B. 1987b.** Détermination des Orthoptéroïdes Ouest-Paléarctiques 1. Tétrigidae de France, Ibérie et Maghreb (Caelifera). 2. Pamphagidae: le genre *Euryparyphes* au Maroc (Caelifera). *L'Entomologiste* **43**: 161–171.
- Descamps M. 1970.** Contribution a la Faune du Maroc.III. Acridoidea du Maroc saharien et Dericorythinae (Orth.). *Bulletin de la Société entomologique de France* **75**: 24–36.
- Dirsh V.M. 1950.** A contribution to the fauna of Acrididae of Syria and neighbouring countries. *Eos* **26**: 54–71.
- Eades D.C., Otte D., Cigliano M.M., Braun H. 2011.** *Orthoptera Species File Online. Version 2.0/4.0* (accessed: August 2011). <http://Orthoptera.SpeciesFile.org>.
- Festa E. 1894.** Viaggio del Dr. E. Festa in Palestina, nel Libano e regioni vicine. Parte narrativa. *Bollettino Museo Zoologia Anatomia comparata Reale Università Torino* **9** (172): 1–38.
- Fischelson L. 1985.** *Fauna Palaestina. Insecta Orthoptera Acridoidea*. Israel Academy of Sciences and Humanities, 240 p.
- Fischer L.H. 1853.** *Orthoptera Europaea*. Leipzig, 454 p.

- Kirby W.F. 1910.** *A synonymic catalogue of the Orthoptera. III. Orthoptera Saltatoria. Part II (Locustidae vel Acridiidae)*. London, 674 p.
- Koçak A.Ö., Kemal M. 2010.** Validity of the subgenus name *Lativertex* Werner, 1939 (Orthoptera, Pamphagidae). *Centre of Entomological Studies Ankara, Miscellaneous papers* **153**: 4-5.
- La Greca M. 1993.** Le specie marocchine dei generi *Euryparyphes* Fischer, *Paraeumigus* Bolivar, *Paraeuryparyphes* gen. n., *Nadigeumigus* gen. n., *Pseudamigus* Chopard, e *Amigus* Bolivar (Orthoptera, Pamphagidae). *Bollettino Accademia Gioenia Scienze Naturali Catania* **26**: 293-414.
- Llorente del Moral V., Presa Asensio J.J. 1997.** *Los Pamphagidae de la Peninsula Iberica (Insecta: Orthoptera: Caelifera)*. Universidad de Murcia, 248 p.
- Massa B. 1995.** The Middle eastern genera *Prionosthenus* Bolivar, *Ocnereopsis* Uvarov and *Ocnereosthenus* nov. gen. (Insecta Orthoptera Pamphagidae). *Il Naturalista Siciliano* **19**: 105-127.
- Massa B. 2009.** Annotated check-list of Orthoptera of Libya. *Journal of Orthoptera Research* **18**: 75-93.
- Massa B. 2010.** New or interesting records of Palearctic Orthoptera (Insecta). *Journal of Entomological Research Society* **12**: 75-85.
- Massa B., Fontana P. 2003.** Review of the Middle Eastern Genus *Prionosthenus*. *Memorie della Società Entomologica Italiana* **82** (2): 529-546.
- Massa B., Fontana P. 2007.** The Middle Eastern Genus *Ocnereosthenus* Massa, 1995 (Insecta Orthoptera: Pamphagidae). *Journal of Entomological Research Society* **9** (2): 47-64.
- Morales Agacino E., Descamps M. 1968.** Contribution à la faune du Maroc. I. Genres *Glauia* I. Bolivar, *Gauvarovia* Morales Agacino et *Pseudoglauia* nov. (Oth. Pamphagidae). *Annales de la Société entomologique de France (N.S.)* **4**: 419-435.
- Ramme W. 1951.** Zur Systematik Faunistik und Biologie der Orthopteren von südost-Europa und Vorderasien. *Mitteilungen aus dem Zoologischen Museum in Berlin* **27**: 1-431, 29 pl.
- Saussure H. 1887.** *Spicilegia Entomologica Genavensis. II. Tribu des Pamphagiens*. H.Georg ed., Genève, 92 p.
- Uvarov B.P. 1927.** Notes on Orthoptera from Morocco. *Bulletin de la Société des Sciences Naturelles du Maroc* **7**: 199-215.
- Werner F. 1932a.** Orthopteren aus Marokko und Westalgerien. *Zoologische Anzeiger Leipzig* **100**: 113-127.
- Werner F. 1932b.** Ergebnisse einer zoologischen Forschungsreise nach Marokko. IV. Orthoptera. S.B. *Akademie der Wissenschaften Wien, Mathematisch-Naturwissenschaftliche Klasse* **141**: 111-174.
- Werner F. 1933.** Orthopteren aus Marokko. II Teil. *Zoologische Anzeiger Leipzig* **103**: 78-88.
- Werner F. 1939.** Über einige Orthopteren aus Iran. *Konowia* **17** (1938): 125-137.