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## TWO NEW RECORDS OF LEAFHOPPERS (HOMOPTERA, AUCHENORRHYNCHA, CICADELLIDAE) FROM THE SMALL SALVAGE ISLAND (1)


by

J. Alberto Quartau (2)


With 10 figures


**ABSTRACT** : As a result of a recent Zoological Expedition to the archipelago of the Salvages, between Madeira and the Canaries, **Circulifer opacipennis** (LETHIERRY, 1876) and **Exitianus fasciolatus** (MELICHAR, 1911) were collected at the Small Salvage and are here reported for the first time from the Salvages. This paper describes and illustrates these two species, giving additionally some taxonomic and ecological notes.

**SUMÁRIO** : Como resultado duma recente Expedição Zoológica às Ilhas Selvagens, entre a Madeira e as Canárias, **Circulifer opacipennis** (LETHIERRY, 1876) e **Exitianus fasciolatus** (MELICHAR, 1911) foram colhidos na Selvagem Pequena e são aqui apontados como espécies novas para as Selvagens. Este trabalho descreve e ilustra estas duas espécies, dando adicionalmente algumas notas taxonómicas e ecológicas.


The Salvage Islands consist of three small uninhabited Portuguese islands, situated between Madeira and the Canaries at about 160 miles from the former and eighty-five from Tenerife. This small archipelago is made up of an island named Selvagem Grande, Ilha Grande or the Great Salvage, a larger islet named Selvagem Pequena, Pitão Grande or the Small Salvage, and a smaller one called Pitão Pequeno, Ilhéu de Fora or the Little Piton, together with several rocks and rocky banks.

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(2) Centro de Fauna Portuguesa da Universidade de Lisboa. Laboratório Zoológico e Antropológico, Faculdade de Ciências de Lisboa, 1200 Lisboa.

The Great Salvage, the largest and highest island of the archipelago, lies in latitude 15° 55′ N. and longitude 30° 8′ W. On the other hand, the Small Salvage lies at a distance of eight and a quarter miles from the south-western side of the former, and is characterized by a constantly emerged area of only 800 m by 500 m. It is a low island, its highest point being pico do Veado with 49 m, and has an interesting floristic community which literally covers its flat sandy surface. It is an island of considerable ecological interest since it probably provides unique evidence of the original spontaneous vegetation in the area, having been scarcely visited by man. By decree of 29 October 1971, the Salvages are an Integral Nature Reserve under the Portuguese Department of Water and Forests.

This archipelago was visited recently by a Portuguese Zoological Expedition (cf. QUARTAU, 1981a) and, as a result of the field-work carried out there, a new species of the genus *Brachypterona* LINDBERG (Homoptera, Cicadellidae) was found (cf. QUARTAU, 1981b). This paper deals with the finding at the Small Salvage of two other cicadellids which are here recorded for the first time from the Salvages — *Circulifer opacipennis* (LETHIERRY, 1876) and *Exitianus fasciolatus* (MELICHAR, 1911).

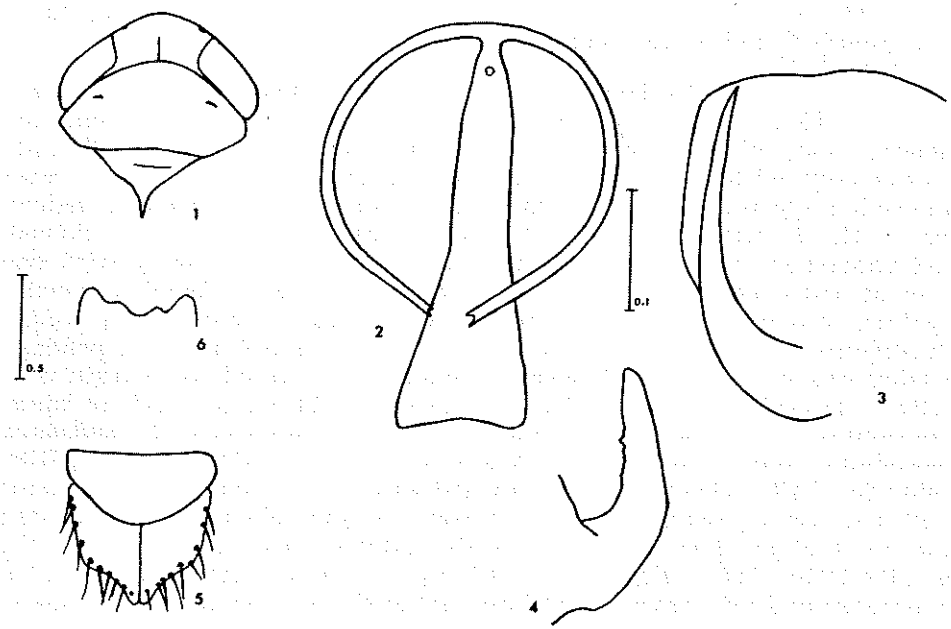
## **Circulifer opacipennis** (Lethierry, 1876)

*Circulifer* ZACHVATKIN, 1935 has been considered by some authors a synonym of *Neoaliturus* DISTANT, 1918 and as such the generic name *Neoaliturus* has been frequently used in combination with *tenellus* (BAKER), *opacipennis* (LETHIERRY) and other related species (e.g., DLABOLA, 1964, 1965; LINNAVUORI, 1965; and KALKANDELEN, 1974). However, other authors have retained the generic name *Circulifer* for species such as *tenellus, haematoceps* and *opacipennis,* among others. I am following here this latter concept by accepting the recent interpretation of *Circulifer* and *Neoaliturus* of OMAN (1970). The main features provided by OMAN for separation and recognition of these two genera are the presence in *Circulifer* of the following: (a) tegmina without sharply delimited, pale translucent spots apically; (b) male plates usually broad and short, often subtruncate distally; (c) shaft of aedeagus without lateral projections at midpoint; (d) terminal aedeagal rami forming a nearly complete circle; and (e) posterior margin of 7th abdominal sternite of female emarginate medially.

The genus *Circulifer* is taxonomically a difficult group, since some of its species exhibit a remarkable variation. This applies, for instance, to *tenellus* and *opacipennis,* two species with extreme range in overall size and in the shape of the male genitalia as demonstrated by YOUNG & FRAZIER (1954) and by BINDRA *et al.* (1970). It is also a genus of considerable economic importance, since some of its members are vectors of the curly-top virus disease, which causes great losses to

sugar beet (*Beta vulgaris* L.) and other crops (YOUNG & FRAZIER, 1954). This is the case for the beet leafhopper, *Circulifer tenellus* (BAKER), in the U. S. A. (NIELSON, 1968; BINDRA *et al.*, 1970) and *C. opacipennis* (LETHIERRY) in Turkey (BENNETT & TANRISEVER, 1958; BINDRA, 1973).

The *Circulifer* species found at the Small Salvage is here identified as *opacipennis* (LETHIERRY, 1876) following the interpretation of the detailed study on different species of the genus by YOUNG & FRAZIER (1954) as well as the extensive survey on Indian species of




Figs. 1-6. — *Circulifer opacipennis* (Lethierry, 1876): 1, head, pronotum and scutellum, dorsal view; 2, aedeagus, caudal view; 3, left appendage of pygophore, right lateral view; 4, apex of right stylus, dorsal view; 5, genital plates and valve, ventral view; 6, hind margin of female 7th abdominal sternite, ventral view (scales in mm).

the genus conducted by BINDRA *et al.* (1970). *Circulifer opacipennis* is, however, very near *C. tenellus* and since the distributional ranges of these species overlap in North Africa and in the Near East, difficulties for definite identification may be encountered. In fact, the principal morphological differences between *tenellus* and *opacipennis* rely mostly on the shape of the male plates (truncate apically in the former and pointed apically in the latter), structures which are, nevertheless, varia-

ble in both species. However, besides morphological evidence for considering these nominal species as two independent species, there is also ecological evidence for their separation. As a matter of fact, *opacipennis* is most frequently encountered on succulent and somewhat lush vegetation, whereas *tenellus* is usually encountered only in drier situations where vegetation is sparse (OMAN, 1970). If both species were to inhabit the two larger of the Salvage islands (Great Salvage and Small Salvage), *tenellus* would be the candidate for the Great Salvage, which is a much drier island, with a much more sparsely distributed vegetation than the Small Salvage.

The following is a description of the material belonging to *C. opacipennis* found at the Small Salvage.

MALE. Length from apex of crown to tips of tegmina 2.72 - 3.03 mm. Head across eyes wider than greatest width of pronotum. General body colour tawny to yellowish. Crown unmarked, yellowish, occasionally with a few indistinct red or dark spots on disc; crown approximately rounded anteriorly (fig. 1). Pronotum greyish or yellowish, with or without indistinct dark markings. Scutellum yellowish and unmarked except for dark transverse sulcus, occasionally with one pair of indistinct dark spots near anterior margin. Tegmina usually hyaline, yellowish; veins yellowish, sometimes reddish or brownish. Pygophore yellowish, its lobes with a strong spine-shaped appendage arising caudoventrally and nearly reaching the pygophore margin dorsally in lateral aspect (fig. 3). Aedeagus with biramous shaft at apex, the rami of which together form a circle as illustrated (fig. 2); aedeagus resembling that of material from Fraga, Spain (YOUNG & FRAZIER, 1954: fig. 7AA). Genital plates provided with a uniseriate group of about 9-10 macrosetae, triangular, their lateral margins sinuous as illustrated and resembling those of the Spanish material from Lerida (YOUNG & FRAZIER, 1954: fig. 7J). Styli (fig. 4) with apical extension as illustrated and also resembling those of the material from Lerida, Spain.

FEMALE. In the material from the Small Salvage, always larger than male. Length 3.25 - 3.44 mm. Head wider than greatest width of pronotum. Colouration as in male. Hind margin of 7th abdominal sternite emarginate medially, as in fig. 6.

MATERIAL STUDIED. 8 ♂, 7 ♀, Small Salvage, 10.v.1980 (J. A. Quartau); majority from the base of pico do Veado with a mixed vegetation comprising *Suaeda vera, Frankenia laevis, Lotus salvagensis, Mesembryanthemum crystallinum* and *M. nodiflorum, Senecio incrassatus, Beta procumbens,* etc.; also found in the central area of the island where *Suaeda vera* and *Limonium papillatum* var. *callibotryum* dominate, as well as in the area of *Agropyron junceiforme,* in the eastern part of the island.

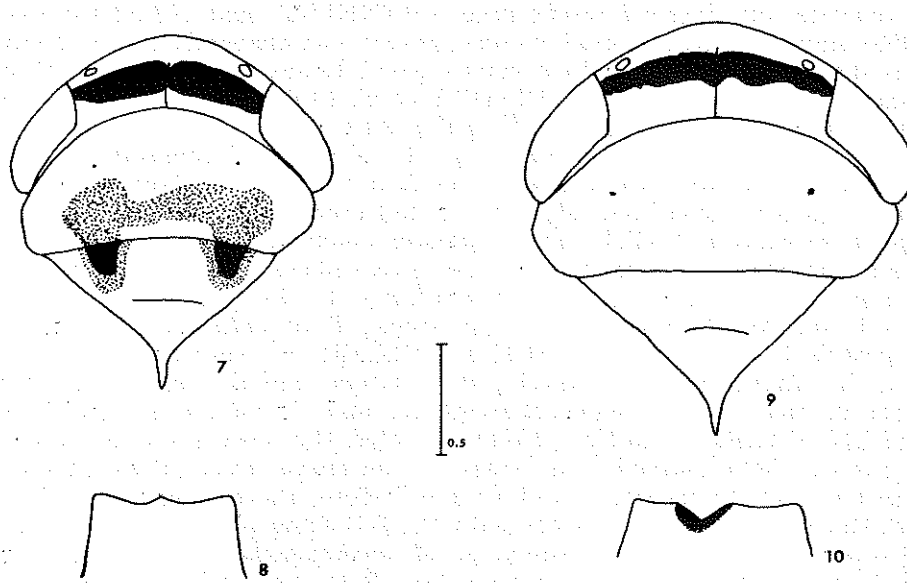
ECOLOGICAL NOTES. This species has been recorded as associated with a large range of different plants. For instance, YOUNG & FRAZIER (1954) give the following as plants where the species was taken: *Atriplex, Cistus, Rosmarinus officinalis* L., *Marrubium, Salicornia, Portulaca oleracea* L., *Thymus, Beta vulgaris* L., *Polygonum, Micromeria,* and *Plantago.* LINDBERG (1954), who apparently referred to this species in the Canaries under the name of *haematoceps* (M. R.), collected the species on *Mesembryanthemum.* BENNETT and TANRISEVER (1958) have established that *C. opacipennis* can transmit the curly-top virus disease in Turkey, which causes great losses to sugar beet *(Beta vulgaris* L.) and other crops. BINDRA *et al.* (1970) gave a long list of plants on which only adults of *opacipennis* were collected, including important crops such as: *Allium cepa* L., *Arachnis hypogaea* L., *Beta vulgaris* L., *Solanum tuberosum* L., and *Zea mays* L. As plants on which both immature forms and adults were collected they referred to *Heliotropium eichwaldi* STEUD, and *Peganum harmala* L. BINDRA (1973) in an important contribution where post-embrionic development and rearing experiments were conducted referred to the following plants as suitable for breeding this species in India: *Beta vulgaris* L., *Brassica campestris* L. var. *toria* DUTHIE & FULLER, *B. oleracea* L. var. *botrytis* L., *Chenopodium album* L., *Pennisetum typhoideum* RICH., *Portulaca oleracea* L., *Spinacia oleracea* L., and *Trifolium alexandrinum* JUSLEN. KALKANDELEN (1974) collected the species on the following plants: *Beta vulgaris* var. *rapa, Lycopersicon esculentum, Medicago sativa,* and *Artemisia.* As referred to before, the species was collected at the Small Salvage in areas with the following plants: *Suaeda vera, Frankenia laevis, Lotus salvagensis, Mesembryanthemum crystallinum* and *M. nodiflorum, Senecio incrassatus, Beta procumbens, Limonium papillatum* var. *callibotryum* and *Agropyron junceiforme.*

The finding of *C. opacipennis* at the Small Salvage, though not unexpected, is an interesting one, since it shows that this leafhopper is a colonist of considerable dispersal capabilities.

### **Exitianus fasciolatus** (Melichar, 1911)

Only one female was collected at the Small Salvage in the area dominated by *Agropyron junceiforme* (figs. 7-8). In the absence of males for a more accurate identification, I am placing this specimen within *Exitianus fasciolatus* (MELICHAR, 1911) on the basis of the illustrations provided by LINDBERG (1954), where *Exitianus capicola* (STÅL, 1855) (under the name of *taeniaticeps)* and *E. fasciolatus* (MELICHAR, 1911) (under the name of *vulnerans)* from the Canaries were treated. Both these species occur as well in the Madeira archipelago (LINDBERG, 1961). For comparative purposes, illustrations of a female of *E. capicola* from Madeira are also given (figs. 9-10).

The head of *Exitianus fasciolatus* is slightly smaller than in *capicola* and the anterior margin of the scutellum has two triangular spots (figs. 7 and 9). The hind margin of the female 8th abdominal sternite has a slightly triangular mesal area instead of being notched as in *capicola* (figs. 8 and 10). The length from apex of crown to tips




Figs. 7-8. — *Exitianus fasciolatus* (Melichar, 1911): 7, head, pronotum and scutellum, dorsal view; 8, hind margin of female 8th abdominal sternite, ventral view. Figs.9-10. — *Exitianus capicola* (Stål, 1855): 9, head, pronotum and scutellum, dorsal view; 10, hind margin of female 8th abdominal sternite, ventral view (scale in mm).

of tegmina of the female collected at the Small Salvage is 5.2 mm. The species inhabits nearby areas such as Madeira, the Canaries and Algeria. It is nevertheless quite interesting to record this species from such a small and isolated island as the Small Salvage.

MATERIAL STUDIED. 1 ♀, Small Salvage, 10.v.1980 (J. A. Quartau), in the area of *Agropyron junceiforme* in the eastern part of the island. Data of the female of *E. capicola* as follows: Monte, Madeira, 19.ix.1972 (Eng. F. Carvalho) (*).

(*) I thank Eng. F. Carvalho for his great kindness in having collected leafhoppers in Madeira on my behalf.

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