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## THE IDENTITY OF THE BRITISH *Monosynamma* SCOTT 1864 (HEM., MIRIDAE)

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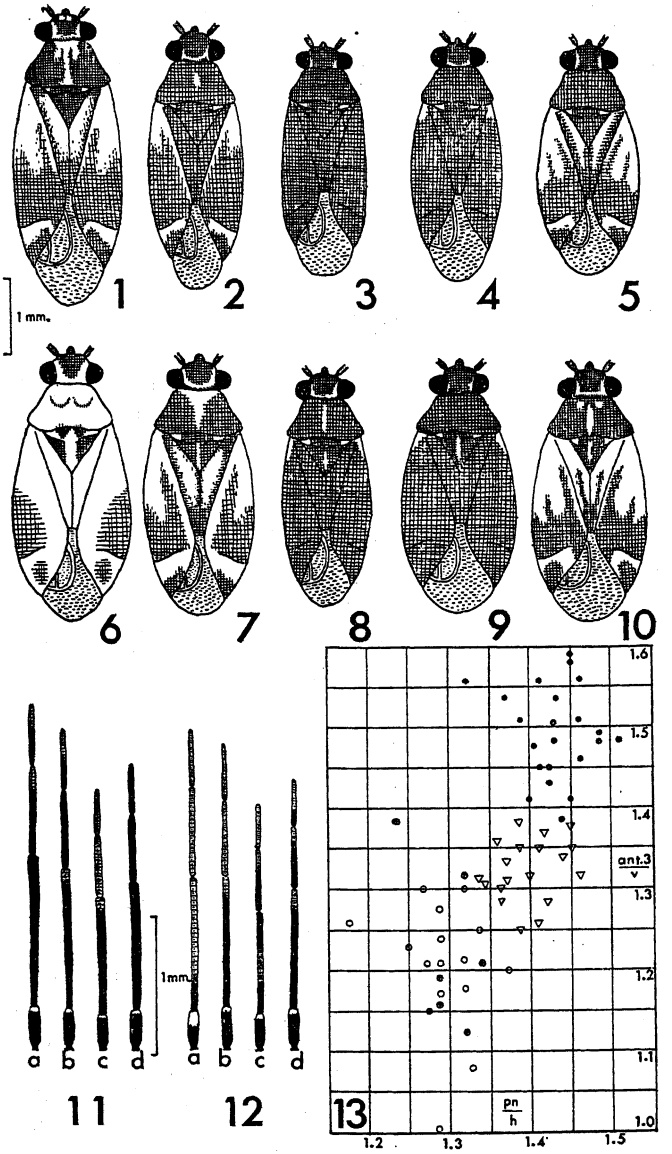
Stichel (1955-61) lists six species of *Monosynamma* Scott. *M. bohemani* (Fallen), 1829, is Holarctic in distribution; *M. nigritula* (Zetterstedt), 1839, is widely distributed in the Palaearctic; *M. sabulicola* Wagner, 1947, is known from Germany, Holland, Austria and Poland; and *M. maritima* Wagner, 1947, is apparently confined to the North Sea coast of Germany and Holland. The remaining two species (from Turkey and from Mongolia) need not be considered here. The genus is normally associated with willows (*Salix* spp.), especially *Salix repens* L.

British records of *Monosynamma* (=*Microsynamma* Fieber; =*Neocoris* Douglas and Scott) are confined to *M. bohemani, M. scotti* Fieber (now regarded as a variety of *bohemani*) and *M. nigritula.* Douglas and Scott (1865) include only *bohemani* and *scotti,* treating them as distinct species and recording both only from *Salix repens* at Deal, Kent. Saunders (1892) retains the two as species (but with *scotti* as a synonym of *nigritula*) but suggests that they are probably only varieties of one species. Butler (1923), on Reuter's authority, accepts Saunders' suggestion and retains only *bohemani* and its var. *scotti* as British. Southwood and Leston (1959) deal only with *bohemani,* without reference to *scotti* or *nigritula.* Finally, Massee (1964) has re-instated *M. nigritula* as a British insect on the basis of specimens captured at Dungeness, Kent, on *Salix repens,* in company with *M. bohemani.*

There are relatively few British records of *Monosynamma* and most British material originates from two localities—the dune slacks at Braunton Burrows, Devon and the Kent coast at Deal and Dungeness. This material has never been critically re-examined since the description of *maritima* and *sabulicola,* so I recently undertook this task, in the light of published information, especially that given in Stichel (1955-61) and Wagner & Weber (1964). Identification of the species of *Monosynamma* has always been based largely on colour, size and shape and, unfortunately, these characters were found to be highly variable. No decisive features of the external morphology or in the structure of the male genitalia have ever been described and I found none in the course of my study. Moreover, purely subjective criteria suggested no very convincing differences between series from different localities, intra-series variation being too great. Consequently I could reach no firm conclusions as to which species of *Monosynamma* were present in Britain.




Figs. 1-10—Outlines of *Monosynamma* spp., illustrating shape and pattern. Figs. 11-12—Antennae. 1-5 and 11—males; 6-10 and 12—females. 1, 6, 11a, 12a—*sabulicola* (Braunton); 2, 7, 11b, 12b—*bohemani* (Virginia Water); 3, 4, 8, 11c, 12c—*nigritula* (Germany); 5, 9, 10, 11d, 12d—*maritima* (Dungeness). Fig. 13—Scatter diagram. Ordinate=ratio of length of 3rd antennal segment to width of vertex; abcissa=ratio of width of pronotal base to width of head. Solid circles ( ● )—*sabulicola;* triangles (▽)—*bohemani;* open circles (O)—*maritima* (bicoloured); open circles with crosses ( ⊕ )—*maritima* (black form) and *nigritula.*

At this stage, at my request, Herr E. Wagner, of Hamburg, kindly supplied me with a series of each of the four species, for comparison with British material. These series were also variable and were in such poor condition that comprehensive measurement of all potentially useful characters could be made on only a few specimens. This was true also of material from the British Museum and from the Hope Department of Entomology, Oxford. As a result I was forced to work largely with specimens collected by myself or by Dr. Massee. My method was to select from the named continental material examples of each species which agreed most closely with the published information. These I then used as standards for subjective comparison with British material, rejecting, for the moment, all specimens not in very close agreement with these standards. In this way I was able to build up series of British origin, in measurable condition, provisionally allocated to species. Comparison was then made between these series by using every character capable of accurate measurement and from the mass of data so obtained two ratios were discovered which appeared to be of use for separating the species as I had identified them. These were the ratio of the width of the pronotal base to the width of the head including eyes and the ratio of the length of the third antennal segment to the width of the vertex. There were no differences between the sexes in respect of these ratios. Unfortunately neither of these ratios gave a clear separation on its own (which probably explains the lack of subjective differences) but when plotted against each other as a scatter diagram (fig. 13), the species formed adjacent but not non-overlapping groups. The unidentifiable remainder of the material was then measured to provide these ratios and added to the diagram, as were ratios from the few measurable continental specimens. Not only did the groups remain largely distinct but they conformed to locality series. Thus, all measurable material from Braunton Burrows (Coll. G.E.W.), Sandscales, Lancs. (Coll. T. R. E. Southwood), a few examples from South Wales and one series (dated 13.vi.63) from Dungeness, Kent (Coll. A. M. Massee) formed the group identified as *sabulicola* (solid circles in the scatter diagram); material collected in a sand-pit at Virginia Water, Surrey (see Woodroffe, 1962) conformed to the group identified as *bohemani* (triangles in the diagram); and several series from Dungeness (Coll. A. M. Massee & G.E.W.) corresponded with the group identified as *maritima* (open circles in the diagram).

The results described above fail to distinguish *maritima* from *nigritula*. In continental keys (e.g. Wagner & Weber, 1964) *nigritula* is separated from the other three on the basis of its entirely black cuneus, though this is present in *bohemani* var. *scotti* and in a black form of *maritima*. In the scatter diagram black specimens from Dungeness and one or two continental *nigritula* (open circles with crosses) do not segregate from bi-coloured *maritima* (open circles) from the same locality. It is

clear, therefore, that these ratios cannot be used to distinguish *maritima* from *nigritula*. It remains to consider whether the two are, in fact, distinct. When, at my request, Herr Wagner examined a series of black and bicoloured specimens from Dungeness he replied (*in litt.*) that he was uncertain of their identity but that he preferred to regard them all as *maritima* rather than as a mixture of *maritima* and *nigritula*. In addition to the colour difference, *M. nigritula* is stated to be a more elongate insect than *maritima* and I found this to be apparently true of some continental males (fig. 3); however, others (fig. 4) were virtually identical in shape with the more elongate male *maritima* and, when the latter are black, quite indistinguishable from them. Many male *maritima*, however, have an extensive pale pattern and some are broadly rounded in shape (fig. 5); I have seen no male *nigritula* as broad as this. In the female, *nigritula* (fig. 8) normally appears more elongate than *maritima* (figs. 9, 10), though the difference is often less marked than is indicated by the drawings. These facts, together with the very wide distribution of *nigritula* compared with the extreme localisation of *maritima*, suggests that the two may continue to be regarded as distinct, pending further evidence. I have, however, no evidence that *M. nigritula* occurs in Britain.

In practice the use of the two ratios given above for identifying the species of *Monosynamma* is difficult because the third antennal segment is very liable to shrivel after death and in much old museum material cannot be measured with any accuracy. Consequently, I give below summaries of the differences in size, shape and colour which may be of some value in identification. I must, however, emphasise strongly the wide variation that occurs in these features within species, resulting in substantial overlap; determinations on this basis can be made with any confidence only if series are available. Some individuals will remain unidentifiable except by association with other, more typical examples unless the necessary measurements can be made with accuracy.

*M. sabulicola*. Males.—length 3·6-3·9 mm.; the largest species, appearing relatively broader than *bohemani* (compare figs. 1 and 2); dark in colour with rather extensive pale pattern, involving forehead and vertex, midline of pronotum, basal angles of scutellum, basal half of hemelytra, including clavus, and base of cuneus (fig. 1); antennae often dark with apices of third and fourth segments paler (fig. 11a). [NB. The apex of the first segment is white in all species.] Females.—Length 3·5-4·0 mm.; sometimes only slightly broader in outline than males but sometimes somewhat brachypterous, with sides strongly rounded (fig. 6); colour varying from pattern nearly as male to almost competely pale, pinkish or pale orange, often with dark marks confined to head, scutellum, apex of corium and centre of cuneus (fig. 6); antennae often with only base of second segment dark (fig. 12a). So far

identified from Sandscales, Lancs.; Gower Peninsular, S. Wales; Braunton Burrows, Devon; Dungeness, Kent.

*M. bohemani.* Males.—length 3·3-3·6 mm.; slightly smaller and appearing more elongate than *sabulicola* (compare figs. 1 and 2); colour dark, pale pattern usually less extensive than in *sabulicola,* pronotum often without pale markings and hemelytra often with only basal third of corium and base of cuneus pale (fig. 2); antennae often with apices of second and fourth segments somewhat paler (fig. 11b). Females.—Length 3·2-3·7 mm.; slightly smaller and apparently more elongate than most female *sabulicola,* not normally brachypterous and strongly rounded at sides as are some females of that species (fig. 7); colour dark but with pale pattern rather more extensive than in male, though seldom as pale as female *sabulicola;* antennae usually with at least basal half of second segment dark (fig. 12b). Rarely (var. *scotti*) whole insect is entirely dark. So far identified only from Virginia Water, Surrey.

*M. maritima.* Males.—Length 2·7-3·5 mm.; slightly smaller than *bohemani* but often appearing broader, being sometimes moderately elongate (as fig. 4) but often rather broad (fig. 5); colour typically with rather extensive pale pattern, affecting basal half of hemelytra and base of cuneus; antennae often entirely dark (fig. 11d). Females.—Length 3·1-3·6 mm.; coloured as males but with rather more extensive pale pattern and usually broad in outline (fig. 10); antennae usually with apices of all segments somewhat paler (fig. 12d); sometimes both sexes black with only vertex and extreme basal angles of scutellum and corium pale (as fig. 4; fig. 9). So far identified only from Deal and Dungeness, Kent.

*M. nigritula.* Size approximately as *maritima*; colour as black form of *maritima;* some males (fig. 3) apparently more elongate but others (fig. 4) indistinguishable from the black form of *maritima,* but never as broad as fig. 5; females (fig. 8) apparently more elongate than the black form of *maritima* (fig. 9). Not so far identified in Britain.

From what has already been said, it is obviously impossible to devise a satisfactory key to the four species of *Monosynamma,* but that given below, if used in conjunction with the synopses and the scatter diagram, should enable most specimens to be determined with moderate confidence.

1. Ratio of length of third antennal segment to width of vertex usually exceeding 1·40 ..... *sabulicola*
— Ratio of length of third antennal segment to width of vertex not usually exceeding 1·40 ..... 2
2. Ratio of width of pronotal base to width of head including eyes usually exceeding 1·35 ..... *bohemani*
— Ratio of width of pronotal base to width of head including eyes not usually exceeding 1·35 ..... *nigritula & maritima*

The very slight taxonomic differences between the four species of *Monosynamma* inevitably raise doubts concerning their status as valid species. However, the co-existence of *sabulicola* and *maritima* at Dungeness seems to preclude subspecific status. As in many other similar cases, probably only breeding and crossing experiments can provide a final answer. At present it seems best to retain them as a group of sibling species, pending further evidence. A more precise knowledge of their ecology and distribution and of the incidence of the black forms would be valuable in this connection.

I am indebted to Drs. A. M. Massee and T. R. E. Southwood, Herr E. Wagner, and the authorities of the British Museum (Natural History) and the Hope Department of Entomology, Oxford, for the gift or loan of specimens.

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## Review

**Bulletins of the British Museum (Natural History) — Entomology. The genus Rhipidocephala (Diptera: Asilidae). Oldroyd, H.** *1966, Vol. 18, No. 5, pp. 143-172, 38 text-figures. 12/-.*

This genus, as now defined, is Ethiopian. Previously, *Rhipidocephala* Herman and a closely allied genus *Holcocephala* Jaennicke, have been recorded from both the Neotropical and Ethiopian Regions. The author discusses the differences between the two genera, and these are re-defined, reasons being given for the present view that *Rhipidocephala* is entirely Ethiopian, whilst *Holcocephala* is entirely Neotropical.

24 species of *Rhipidocephala* are included, 16 of which are new and are fully described. The introduction deals with the generic differences, and includes a discussion on the characters involved. A key to species is given followed by a description of each species arranged in systematic order. The figures illustrate genitalia, both male and female, and other taxonomic features.

The present re-definition of these two genera makes the present publication an indispensible addition to the recently published volumes by Hull on the Robber-flies of the World.

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