

strongly developed as in the tetramoriines, and *Secostruma* appears more *Tetramorium*-like in this aspect (Fig. 3).

5 and 6. A broad median portion of the clypeus which is broadly inserted between widely separated and strongly developed frontal lobes, and the presence of a sharply demarcated frontal triangle, is plesiomorphic in the Myrmicinae as a whole. These character states are shared by both the *Tetramorium*- and *Myrmica*-groups. The shape of the median portion of the clypeus, with its anterior quarter suddenly angled downwards, is common in *Tetramorium* but is much less frequently encountered in the *Myrmica*-group. It reaches its best expression in some species of *Hylomyrma*.

7–9. The form of antennal articulation and shape of the base of the scape seen in *Secostruma* occur widely but by no means consistently in both the tetramoriines and myrmicines. In the latter, however, the antennal club is usually 4-segmented (sometimes the basal club segment, funiculus segment 8, is only weakly differentiated). *Secostruma*, like the tetramoriines, has a strongly defined 3-segmented antennal club (Fig. 3).

10. Lack of frontal carinae and antennal scrobes, a plesiomorphic state in Myrmicinae, is universal in the *Myrmica*-group. These features are usually present in the tetramoriines but may be lacking, perhaps secondarily, in some *Tetramorium* and all *Rhoptromyrmex*.

11. The extreme reduction of the eyes is autapomorphic in *Secostruma*. It is paralleled in two *Tetramorium* species-groups, the *T.inglebyi*-group of the Oriental region and the *T.shilohense*-group of the Afrotropical region. Eyes are always large and conspicuous in members of the *Myrmica*-group.

12 and 13. A compact alitrunk with convex promesonotum and large metapleural lobes occurs in both the tetramoriines and myrmicines. Interestingly at least one African species of the *T.shilohense*-group mentioned above (*T.diemandei*) shows a humped propodeum reminiscent of that seen in *Secostruma* (Fig. 1).

14. The propodeal spiracle is characteristically situated low on the side in both the tetramoriine and myrmicine genus-groups. There is also a marked tendency in both groups for the position of the spiracle to be shifted back, beyond the midlength of the propodeum or even to the

margin of the propodeal declivity. The position of the propodeal spiracle seen in *Secostruma* is duplicated extensively in both the *Tetramorium*- and the *Myrmica*-group.

15. The *Secostruma* configuration of the alitrunk–petiole articulation ventrally, with a long narrow V-shaped open cleft running forward from the posteroventral margin of the alitrunk and between the hind coxae, is predominant in both tetramoriine and myrmicine groups. This articulatory structure is extremely rare and isolated elsewhere in the Myrmicinae, and is certainly a convergent acquisition outside the *Myrmica*- and *Tetramorium*-groups. Within these groups this configuration is found in twelve species-groups of *Tetramorium* and in other tetramoriine genera such as *Rhoptromyrmex*, and in *Pogonomyrmex*, *Ephebomyrmex* and *Hylomyrma* of the *Myrmica*-group. In *Myrmica*, *Manica*, *Decamorium* and two species-groups of *Tetramorium* the cleft remains unopen, but its area is bounded by strong post-processional carinae which diverge posteriorly from the metasternal process, implying that this area may have gained a secondary floor from an originally open condition. In both genus-groups a strongly developed metasternal process is present. Unfortunately the presence of such a process cannot be confirmed in *Secostruma* because of the position of the hind coxae of the holotype.

16. The old character of presence of pectinate tibial spurs on the hind legs, previously much used to diagnose the *Myrmica*-group, is not only very variably developed but is plesiomorphic. The apomorphic condition, exhibited by most members of the *Tetramorium*-group, is the presence of simple spurs or their reduction or loss. *Secostruma* has strongly developed simple spurs on the hind tibiae, but this feature is rendered useless in a phylogenetic sense as some *Myrmica*-group members have finely barbate to simple spurs, as do some members of the *Tetramorium*-group.

17. The shape of the petiole in *Secostruma* (Figs. 1, 2) is most reminiscent of that seen in *Hylomyrma*, particularly *H.immanis* and *H.praepotens* (Kempf, 1973), in which the node and peduncle lose their separate identities through a shortening of the node's anterior face. Obviously these are parallel developments in *H.immanis* and *Secostruma* as other members of *Hylomyrma* show stages back to a more strongly differentiated node (e.g. through forms such as