

on the sides of the head: important characters, which do not match any known living species.

But the definite relationships to the known recent species are not clear at present. For comparison, fig. 15 shows the profile of *T. jamaicensis*, the species living today on the island of Hispaniola.

However, more prominent eyes are known in *Mycetophylax* and the peduncle of the *Myrmicocrypta* species is much more slender than in *Trachymyrmex*. Because both these genera are actually regarded as the most primitive living Attines (KUSNEZOV 1963) and no recent *Trachymyrmex* approaches these two character states, it is easy to deduce that they represent a plesiomorphism of *T. primaevus*.

7.2. Behavioural and ecological remarks

The genus *Trachymyrmex* is one of the 9 or 12 (according to the classification accepted) genera belonging to the tribe Attini. This taxon comprises all the known fungus growing ants (some 200 described species).

The new fossil, *T. primaevus*, fits so well the generic diagnosis of *Trachymyrmex*, and its somatic characters (head shape, tuberculate integument, etc.) are so typical for what one would expect from a fungus-growing ant and are different from other ants, that it is legitimate to suppose that it had a fungus-growing behaviour.

This follows also from the fact that the fossil is a true *Trachymyrmex* and from the supposition that *Trachymyrmex* should rather be near the terminal branch of attine evolution (KUSNEZOV 1963) than near the stem group of Attini. However, as long as no true phylogenetic argumentation exists on the genus level of Attinae, this sort of indirect conclusion remains tentative. Therefore, the direct morphological evidence from the well preserved amber fossil is most decisive.

The fungus growing habit of the gardening ants is an external symbiosis based on complex ethological and ecological factors.

The ants cut with their large and strong mandibles parts of leaves and petals and transport them between the mandibles into their nests which enclose special chambers for the fungus cultivations. The ants do not eat the leaves but use them as medium for cultivating fungus colonies, the fungus being the main or exclusive food. Neither the cutting of the leaves nor the growing of the fungus is accidental. The ants select the material on the basis of its physical and chemical properties and they developed special secreta and special behaviours. (Without the specialized treatment, the fungus grows so slowly that it is overgrown by other microorganisms.) The ants clean the leaf pieces from undesired microorganisms, cut them in small pieces, cover them with saliva and a drop of fresh faeces (with its amino acids, enzymes, etc., originating in part from well growing parts of the fungus cultivation), they then add the correct fungus, transport it to suitable places and rid the cultivation of rival fungus species and of exhausted substratum. The ants eat only special parts of the fungus and are able to let the cultivation continue for an indefinite period.