Ochlerotatus Caspius Complex

Two apparently morphologically identical forms of *Oc. caspius* designated as "species A" and "species B" were detected by electrophoretic analysis of wild populations from Italy (Cianchi et al. 1980). As no morphological and/or biological differences were attributed to those sibling species, they will be treated together under the description of the nominative form. Another species, described as *Aedes duplex*, was recorded from the European part of Russia by Martini (1926). The two male specimens particularly exhibit differences in their hypopygium with the basal lobe bearing 4 spine-like setae instead of 2 setae. As no further record of any stage of *Ae. duplex* has been made since that time, it is more probable that the two sampled males are only aberrant specimens, thus *Ae. duplex* should not be regarded as a distinct species and member of the Ochlerotatus Caspius Complex.

Ochlerotatus (*Ochlerotatus*) *caspius* (Pallas 1771)

Female: *Oc. caspius* is very similar to *Oc. dorsalis* in general colouration, but is usually distinguished from the latter by two dorsocentral white stripes which run over the bright fawn coloured scutum. However, the colouration of *Oc. caspius* is subject to considerable variation. The proboscis and palps are covered with brown and white scales (Fig. 6.30b). The vertex has white and yellowish brown scales intermixed. The scutum has two narrow, white dorsocentral stripes running continuously from its anterior to posterior margin (Fig. 6.22a). The stripes may also be wide and diffuse, and if more yellowish, indistinct against the light brown background, but when the scales are well preserved, the distinction from the scutal pattern of *Oc. dorsalis* is quite easy. Even in species with the scales rubbed off from the central part of the scutum, the anterior and/or posterior parts of the longitudinal stripes are often well preserved and visible. The scales on the pleurites are broad and white. Tarsomeres I and II of the fore and mid legs and tarsomeres I–IV of the hind legs have white or cream-coloured basal and apical rings (Fig. 6.19a). The light rings are sometimes indistinct, and hind tarsomere V is entirely white scaled. The wing veins are covered with mixed dark and pale scales (Fig. 6.22b). At the basal quarter of the costa (C), the dark and pale scales are of more or less the same number or the dark scales predominate. The abdominal terga are dark brown scaled, with yellowish scales dorsally and white scales laterally. The terga have basal and apical yellowish bands which are widest in the middle. A longitudinal middorsal yellowish stripe is present, but of varying length (Fig. 6.21a). It is usually present on terga II–IV, otherwise only vaguely expressed by a median widening of the transverse bands. In some specimens the median stripe is present on tergum II only (this pattern resembles that of *Cs. annulata*). The lateral sides of the terga are ornamented with central, triangular, white patches. Tergum VII has mixed dark and pale scales.

Male (Fig. 10.28): The basal lobe gradually arises from the gonocoxite, and is not constricted at the base. Two spine-like setae arise from it, one seta is longer and sharply hooked at the apex, the tip of the hook extends backwards to almost the middle of the spine, and the shorter seta is straight or slightly curved (Fig. 7.35a). The apical lobe of the gonocoxite is inconspicuous, almost bare dorsally. The claspette filament is about as long as the stem, with a narrow unilateral wing.

Larva: Similar to those of *Oc. dorsalis*, *Oc. detritus*, *Oc. leucomelas* and *Oc. flavescens*. Average values of some quantitative traits can be used to distinguish between larvae of *Oc. caspius* and *Oc. dorsalis*, but only at population levels (Milankov et al. 1998). The antenna is about half as long as the head, with sparse tiny spicules. The antennal seta (1-A) is inserted slightly below the middle of the antennal shaft, usually

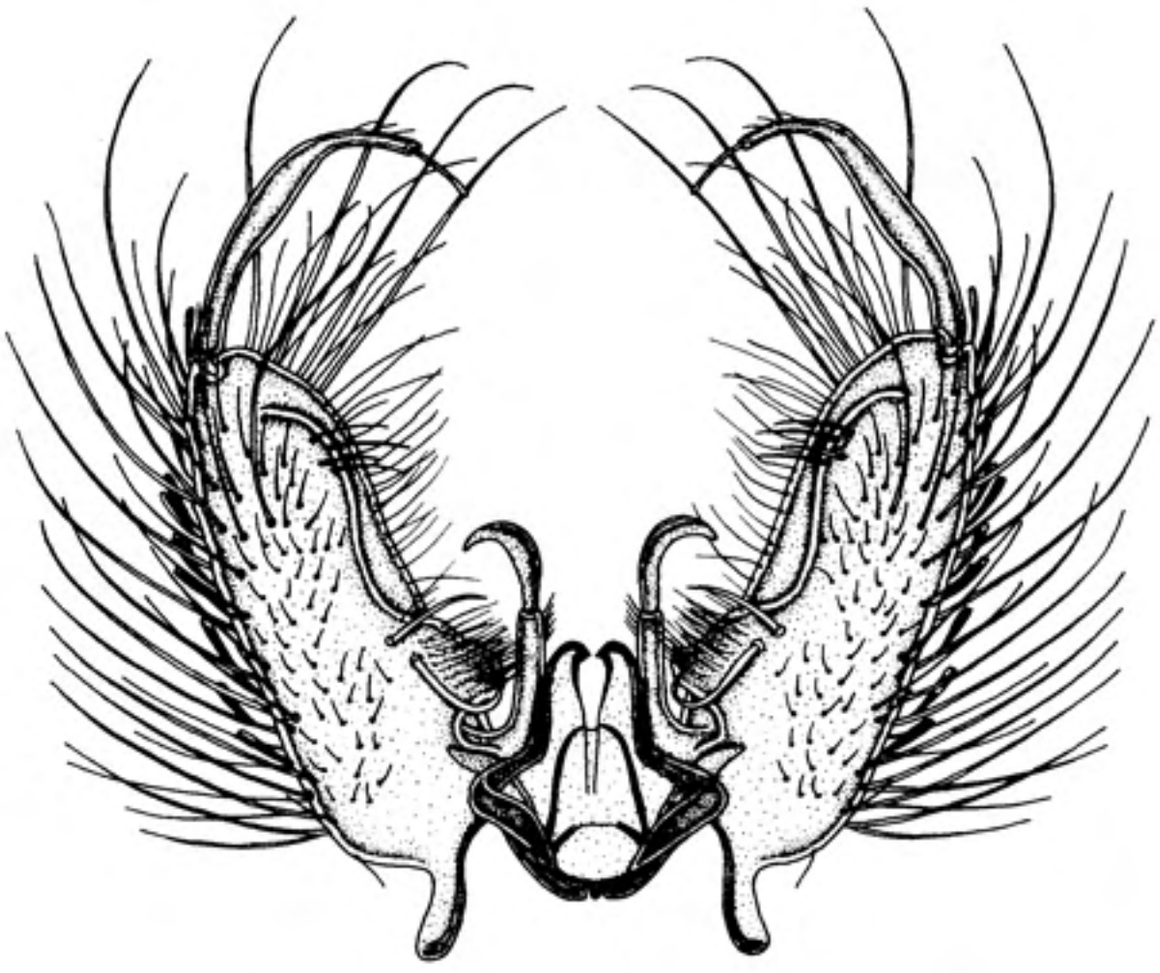

Fig. 10.28 Hypopygium of *Oc. caspius*

with 9 branches which are half as long as the antenna. The postclypeal seta (4-C) has 3–5 short, thin branches. The inner frontal seta (5-C) is inserted well below the median frontal seta (6-C), both are single, or less frequently 2-branched, but rarely does one of the setae have 3 branches. The outer frontal seta (7-C) has 7–10 branches. The mesothoracic seta 1-M is single and moderately long. The comb consists of 18–28 (usually 20–25) variegated scales arranged in 2–3 irregular rows (Fig. 10.29). At least some of the scales have a distinct median spine (Fig. 8.37b). The siphon slightly tapers in the apical half, and the siphonal index is 1.8–2.6. The pecten has 17–26 (usually 20–22) evenly spaced teeth, the basalmost four teeth are rudimentary. The pecten extends slightly beyond the middle of the siphon. The siphonal tuft (1-S) has 5–10 branches inserted beyond the middle of the siphon. The saddle covers more than half of the lateral sides of the anal segment. The saddle seta (1-X) is about half as long as the saddle, and is single. The lower anal seta (3-X) is longer than the siphon, and single. The ventral brush is made up of 12–17 cratal tufts (4-X) and 2–3 precratal tufts. The anal papillae are short, 0.3–0.9 times as long as the saddle, and lanceolate. The ventral pair is shorter than the dorsal pair.

Biology: *Oc. caspius* is a polycyclic, halophylic species. Sometimes only one generation per year is produced due to the nature of the breeding site. The species overwinters in the egg stage, the first occurrence of larvae varies with the latitude, but generally takes place at the beginning of the year, this may be February–March in southern parts of Europe. It is regarded as a seaside mosquito that readily breeds in inland salt marshes and freshwaters with 0.5 g NaCl/l (Pires et al. 1982). It is a common species in the Atlantic and Mediterranean coastal marches and rockholes. The breeding sites in the coastal areas of Portugal are usually restricted to altitudes <50 m (Ribeiro et al. 1989). The larvae develop in open or shaded waters, permanent or temporary water bodies formed by the snow melt, river floods or coastal marshes subjected to intermittent flooding and rice fields, usually with little vegetation and muddy bottom, often with a high concentration of salt, which may reach values of up to 150 g/l (Bozicic-Lothrop 1988). The acidity of the breeding sites recorded in Portugal ranged from pH 6.0–7.0 (Pires et al. 1982). The most characteristic freshwater habitats are river valleys, where larvae can breed in large numbers in the floodplains. They can be associated with larvae of many mosquito species, such as *An. atroparvus*, *An. maculipennis*, *Ae. vexans*, *Ae. vittatus*, *Oc. annulipes*, *Oc. cantans*, *Oc. detritus*, *Oc. intrudens*, *Oc. mariae*, *Oc. sticticus*, *Cx. p. pipiens*, *Cx. theileri*, *Cx. impudicus*, *Cs. annulata* (Bozkov et al. 1969; Ramos et al. 1978; Pires et al. 1982; Knoz and Vanhara 1982; Marchi and Munstermann 1987). Although females are strongly exophagic, they enter inhabited areas, houses, and cattle sheds if they occur in masses. The females readily bite humans and animals both in rural and urban areas (Gutsevich et al. 1974). They often bite during the day and night, but usually most actively search for a blood meal at dusk. Females are repelled by the lights of standard CDC miniature light traps. The species has a high resistance to heat and drought. Females actively search for blood at temperatures ranging from 11.5 to 36°C and relative humidity ranging from 47 to 92% (Petric 1989). They may migrate for long distances, up to 10 km. Autogenous development of *Oc. caspius* was detected in Uzbekistan (Chinaev 1964).

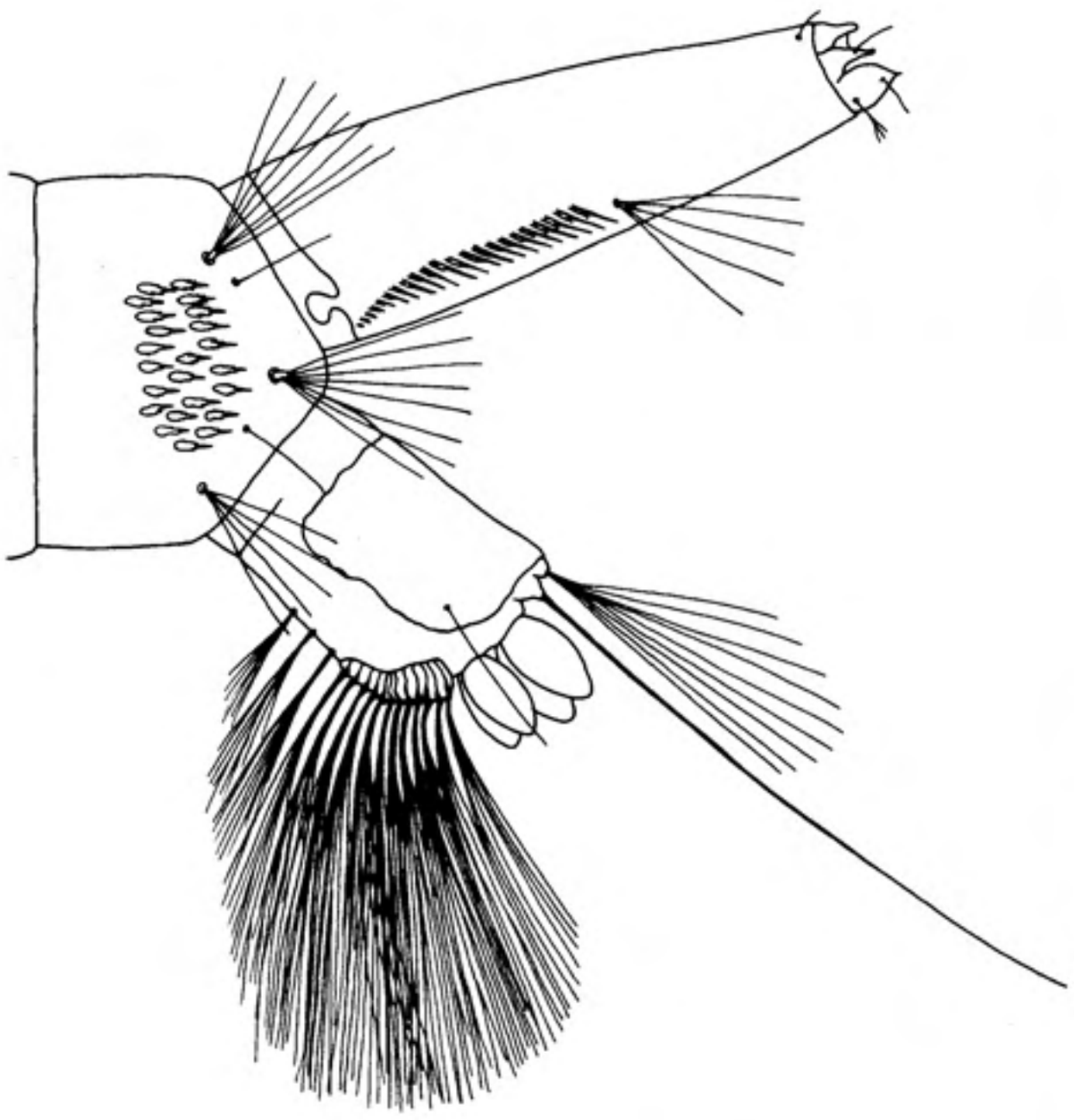

Fig. 10.29 Larva of *Oc. caspius*

Distribution: It is a Palaearctic species which is more common in southern and dry regions than *Oc. dorsalis* which is of Holarctic origin. *Oc. caspius* is distributed from Europe to Mongolia, north and west China, north Africa, west and middle Asia. In Europe it can be found from England to the central parts of

Russia, and from the southwest to the Mediterranean basin. The distributions of the sympatric *Oc. caspius* and *Oc. dorsalis* overlap in most of Europe.

Medical importance: West Nile virus (WNV), Tahyna virus, and the bacterium *Francisella tularensis*, the causative agent of tularemia, could be detected in natural populations (Detinova and Smelova 1973). *Oc. caspius* may have played a role in the spread of tularaemia and transmission of Tahyna and rabbit myxoma viruses in former Czechoslovakia, France, and Portugal (Bardos and Danielova 1959; Joubert 1975; Pires et al. 1982).

Note on systematics: Most authors consider *Oc. caspius* and *Oc. dorsalis* as separate species according to morphologic and genetic differences (Edwards 1921; Natvig 1948; Mohrig 1969; Lambert et al. 1990; Milankov et al. 1998, 2000). Concerning the morphological variation within *Oc. caspius*, Kazantsev (1931) found that the light, "sand-coloured" *Oc. caspius* developed in water with a high salinity, whereas mosquitoes breeding in fresh water had a more contrasting colouration. Specimens with intermediate morphological characteristics are common in Europe (Bozicic-Lothrop 1988) as also in more eastern regions of the former USSR (Gutsevich 1977). Three intermediate types of scutal colouration and two intermediate types of male genitalia are described in Europe, but no correlation between water salinity and scutal pattern or development of the basal lobe of the gonocoxite were found (Bozicic-Lothrop 1988). All the above mentioned differences could suggest the possible presence of subspecies or more than one species in Europe, which was documented by Cianchi et al. (1980).

Ochlerotatus (*Ochlerotatus*) *cataphylla* (Dyar 1916)

Female: The proboscis is entirely dark scaled, which is the main character to distinguish the species from *Oc. leucomelas*, which has the proboscis speckled with numerous pale scales. The palps of *Oc. cataphylla* are dark scaled, with numerous scattered white scales. The scutum is usually covered with reddish brown scales, with lateral areas of paler scales. Sometimes a broad median stripe and two posterior submedian stripes of darker scales are present. The pleurites are extensively covered with scales. The upper part of the postpronotum is mostly brown scaled, and the lower part has pale scales. Postpronotal setae are present along the posterior margin of the postpronotum (Fig. 6.41b). The postprocoxal membrane has a patch of pale scales. The subspiracular area is more or less entirely covered with scales, and the hypostigmal and postspiracular patches are fused. The upper and posterior part of the mesepisternum are extensively scaled, the scales extending near to the anterior angle. The scales on the mesepimeron end before its lower margin, and mesepimeral setae are present. The femora anteriorly have pale and dark scales. The tibiae and tarsi are mostly dark scaled, but with pale scales especially on the ventral surface, and the tarsi are without white rings. The tarsal claws are small and evenly curved. The wing veins have pale scales on the base of the costa (C) and scattered pale scales along the costa, subcosta (Sc) and R_1; the remaining veins are dark scaled. The terga are dark scaled with broad basal bands of white scales (Fig. 6.38b), sometimes the last terga are mainly covered with white scales.

Male: The lateral lobes of tergum IX have 4–13 (usually 6–8) short spine-like setae. The gonocoxite has well developed basal and apical lobes. All the setae located on the inner side of the gonocoxite above the basal lobe are inwardly directed, and usually overlapping in the middle (Fig. 10.30). The basal lobe is conical with a group of medially directed long setae, one of which is strong, spine-like, and apically curved. The

Fig. 10.30 Hypopygium of *Oc. cataphylla*