LARVAL ODONATA IN WATER-CONTAINING TREEHOLES AT THE KENYA COAST

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Abstract — Odon. larvae were recovered in 15 of 295 water samples from treeholes at Rabai and Shimba Hills, Kenya. One individual was identified as *Coryphagrion grandis* Morton (Zygoptera: Megapodagrionidae), the first record of a larval habitat for this sp. 12 spp. of mosquito larvae were recorded in association with the Odon. in treeholes.

Study area, methods, and identifications

In the course of investigations of the community of mosquitoes inhabiting water-containing treeholes at the Kenya coast (LOUNIBOS, in press), a total of 23 larval Odonata were recovered in 13 of 163 samples from Makadara Forest, Shimba Hills National Park (4°16′ S, 39°22′ E) and in 2 of 132 samples from Kombeni Forest, Rabai Location (3°55′ S, 39°34′ E). Both sites are classified as *Sterculia-Chlorophora/Memecylon* lowland rainforests (MOOMAW, 1960).

Fourteen of the collections positive for odonates were made in the rainy periods of April-May in 1976 and 1977 and the fifteenth in January 1977. The seasonal occurrence of treeholes holding water at the Kenya coast is described elsewhere (LOUNIBOS, in press). Treeholes were sampled by extracting all free-standing water with a large-bore pipette (inner diameter 0.5 cm), and aquatic fauna were reared in the laboratory for specific identifications. The collected Odonata fed on mosquito larvae provided as food. Only a single individual completed larval development in captivity: the partially-eclosed imago was identified as *Coryphagrion grandis* Morton, the only member of the Megapodagrionidae known from Africa. Heretofore collected only as an adult, this species had previously been recorded from both Rabai and Shimba Hills (PINHEY, 1961).

Microhabitat and mosquito associates

The fifteen treeholes harboring odonate larvae contained a median fluid volume of 275 ml (range: 25-1375 ml) at the time of collection. Four of the collections containing Odonata came from water-containing root buttresses of *Trachylobium verrucosum* (Caesalpinaceae) in Makadara Forest and two from water-filled cavities in a horizontal log. The remaining positive treeholes were five rot holes and four pans (sensu KITCHING, 1971) 18 to 157 cm above the ground. The odonate larvae were not restricted to wide-mouthed holes: three of the four pans had diameters of less than 5 cm at their apertures.

All but one of the fifteen treeholes contained mosquito larvae in association with the Odonata. The species identified and their frequency of co-occurrence with the Odonata were: *Aedes teesdalei* Van Someren (12 x), — *A. heischi* Van Someren (8 x), — *A. aegypti* (L.) (8 x), — *A. dendrophilus* Edw. (4 x), — *A. fulgens* (Edw.) (3 x), — *A. michaelikati* Van Someren (2 x), — *A. soleatus* Edw. (1 x), — *A.*

ingrami (Edw.) (1 x), — *Culex horridus* Edw. (2 x), — *C. nebulosus* Theo. (2 x), — *Toxorhynchites brevipalpis* Theo. (2 x), — *Eretmapodites subsimplicipes* Edw. (1 x).
The rank order of co-occurrence of mosquito species with Odonata in Makadara Forest was highly correlated with the rank order of abundance of species found in all treehole samples from that locality (Kendall's tau = 0.800, $t_s = 4.21$, $p < 0.001$), suggesting that these Odonata occupy treeholes with the same selectivity as the community of mosquitoes occurring in this microhabitat.

Discussion

Adults of *C. grandis* have been captured only in forests of the coastal belt of Kenya and Tanzania (PINHEY, 1961). Water-containing treeholes represent the most permanent water catchments in the vicinity of Makadara Forest, Shimba Hills, and it is conceivable that treeholes provide the primary larval habitat for this species. The recent discovery of megapodagrionid larvae inhabiting treeholes in Australian rainforest (WATSON & DYCE, 1978) supports this suggestion.

It should not necessarily be assumed that all Odonata captured in this study were *C. grandis*, since CORBET (1961) recovered libellulid larvae in cut bamboo sections in East Africa, and other Zygoptera are known to inhabit various plant-held waters elsewhere in the tropics (CORBET, 1962). Although odonate larvae were found in only 5.8% of the treeholes examined in this study, the use of a pipette to extract samples may have excluded large larvae, thereby leading to an underestimate of the true frequency of Odonata in this microhabitat. It is possible that Odonata inhabiting treeholes may, under certain circumstances, regulate populations of their mosquito prey which include known disease transmitters such as *A. aegypti*.

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References — CORBET, P.S., 1961, *Trans. R. ent. Soc. Lond.* 113: 275-283; — CORBET, P.S., 1962, *A biology of dragonflies*. Witherby, London; —, KITCHING, R.L., 1971, *J. Anim. Ecol.* 40: 281-302; — LOUNIBOS, L.P., in press, *Ecol. Ent.*, — MOOMAW, J.C., 1960, *A study of the plant ecology of the coast region of Kenya East Africa*. Government Printer, Nairobi; — PINHEY, E.C.G., 1961, *A survey of dragonflies (order Odonata) of Eastern Africa*. Cowles, London-Beccles; — WATSON, J.A.L. & A.L. DYCE, 1978, *J. Aust. ent. Soc.* 17: 361-362.

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