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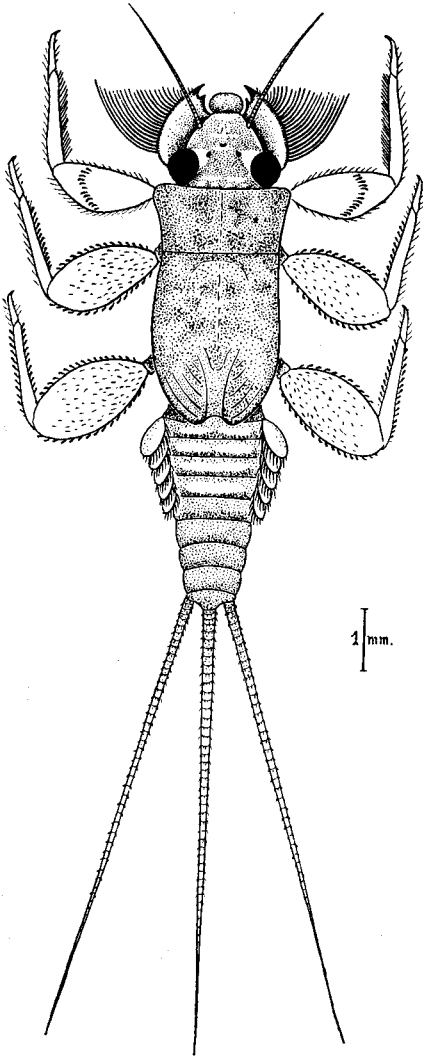
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CAPE MAY-FLIES

By A. CECIL HARRISON

PART IX. THE FAMILY BRACHYCERCIDAE. (Continued)

"Worcester Dark Blue", *Tricorythus discolor* (Burm.).



Worcester Dark Blue Nymph.

K. H. Barnard del.

HERE again we have a fly with only a single pair of wings, but sporting three tail whisks. It is considerably larger than its relative the Cape Cain-fly (page 114, No. 16), the body of the female being 7—7.5 mm. long and her wing 10—11 mm. long and tail cerci 10—12 mm. long. The body of the male is somewhat smaller, his wings are short, and his cerci longer than those of the female but not so relatively enormous as those of the male Cain-fly. There is a family resemblance between them, particularly in the shape and hairy hind margin of the wing, but the chosen haunts of the two species are very different although they may occur within a few yards of each other.

Whereas the nymph of the Cape Cain-fly, *Austrocaenis capensis*, is adapted for dwelling on muddy or silted bottoms in still or very sluggish water, that of the Worcester Dark Blue is highly specialized for residence under river stones in swift or torrential flow and is rather intolerant of stagnant water conditions.

The Rev. A. E. Eaton founded the genus *Tricorythus* ("with triple plume") in 1868, and later Burmeister's species *discolor*, 1839, "described from a specimen from the Cape of Good Hope", was included therein.

In his monograph on South African May-flies, 1932, Dr. K. H. Barnard pointed out that whilst *Tricorythus* occurs from South Africa to Egypt, it appears to be absent from mountain streams of the extreme south-western tip of the continent. Thus whilst it is found in the upper Breede River in Michell's Pass and in the Hex and

other tributaries flowing from the main mountain ranges, and at Tulbagh; across the valley of the Breede River, it appears to be absent from streams flowing from the detached mountain massif Wellington-Slanghoek-Goudini-Villiersdorp-Fransch Hoek-Drakensberg-Stellenbosch-Hottentots Holland.

During the period of intensive collecting, 1930-32, or on later occasions, it has

not been found in the tributaries of the Breede River coming from that detached mountain massif, viz. Witte River (Bain's Kloof), Smalblaar River (Du Toits Kloof) and Holsloot River (Louwshoek); nor in the upper Berg River and its tributaries the Groot Drakenstein Dwaars and the Wemmer. It certainly does not occur in the Eerste and Lourens rivers and the streams of the Cape Peninsula.

Dr. Barnard says that, physiographically, the river at Tulbagh belongs to the Breede River system, as prior to its capture by the Little Berg River cutting through Tulbagh Poort it formed the headquarters of the Breede River. The presence of *Tricorythus* at Tulbagh is therefore not surprising—"but its absence in the tributaries flowing into the Breede River *from the south* is surprising, and at present inexplicable".

(In his *Revision of the Indigenous Freshwater Fishes of the S.W. Cape Region*, Ann.S.A.Mus., 1943, Dr. Barnard cites the topographical evidence of headwater capture by the Little Berg River as one possible explanation of the occurrence of the witvis, *Barbus andrewi*, in both the Berg and Breede river systems, to which the species is confined.)

Very recent collecting has shown that the May-fly *T.discolor* occurs right down the Little Berg River towards its junction with the Great Berg River at Gouda, and downstream in the main river to Piketberg, wherever the river flows in a rocky and stony bed. Above Gouda, the Berg River comes through low-lying areas, and its bed is sandy, muddy and often stagnant—conditions which do not favour the existence of the nymph of *T.discolor*. Rather similar conditions intervene in parts of the Breede River below Michell's Pass down to the junctions of the Witte, Smalblaar and Holsloot rivers, and the migration of the species by water may have been hampered by marshes in the deltas of these tributaries.

These factors alone would not serve to check the spread of a strong-flying May-fly, but, as will be shown, the Worcester Dark Blue seems to be capable of only very local flights.

This remarkable little May-fly appears to be almost blue-black all over the body, and its wings are sooty-grey, particularly along the leading edge. Anglers on the Hex River knew it long before its life-history was worked out in 1931, noticing that the flies appeared in swarms over the river in late afternoon and evening during the trout season. They could scarcely be overlooked on some occasions when they emerge in great numbers, settling on all sorts of objects near the river, including the angler himself.

When the matter was investigated early in April, 1931, it was found that the subimagos make a short flight soon after they have struggled out of the nymphal shuck, preferably to a large boulder nearby where they rest with the wings spread out horizontally and pressed flat against the stone, usually on a sheltered side. In this posture—a very unusual one for May-flies—they resemble Geometrid moths. The final moult to the imago stage takes place in only about an hour, and the rocks near the river get covered with the cast subimaginal skins.

This short duration of the subimago stage was proved by collecting some of the duns as soon as they had emerged from nymphs on the river stones, and observing them at frequent intervals in dry glass-topped boxes.

Furthermore, it was found that the imagos of both sexes—the perfectly developed breeding insects—died in about an hour after the final moult. The total aerial existence of *T.discolor* is thus very brief.

Dr. Barnard considered that the unique resting position of the subimago may be correlated with the rapid change to the imago; the outspread attitude of the fly against the sun-warmed rocks helping to dry up and loosen the subimaginal skin for a quick moult.

It seems possible that the very short duration of the winged stages has limited the spread of this species across areas where the water conditions are unfavourable for the existence of the aquatic stages.

The hunt for the nymph of *T. discolor*, up to then undiscovered, was successful at Easter, 1931, when the Hex River was very low. It is diarized for April 4: "In the afternoon, we went to 'Tommy Heatlie's Pool' and fished thereabouts. I found my first *T. discolor* nymph in the stony run below the pool, and was surprised that it resembled an Ephemerellid rather than a Caenid, and later found that they teemed under the blackened stones in the remaining flow of the river. Whilst I was searching below, Berty Packham caught a rainbow of about 1½ lb. at the head of the pool."

(In November, 1950, this incident was remembered, and the diary entry for the 19th reads: "Crept in at the head of Tommy Heatlie's Pool and hooked a grand fighting rainbow on a No. 6 Invicta. It tore right down the pool and I managed to follow it, and netted it near the tail end—a two-pound hen which had been feeding on rooiwerk minnows." The trout was got into the net at the spot where the first *T. discolor* nymph was secured in April, 1931, but, alas!, the whole "run" had become a channel of silt and sand from soil-erosion higher up the Hex River Valley.)

The nymphs of *T. discolor* are specialized for life in strongly flowing water. The body and the upper segments of the legs (femora) are flattened to offer the minimum of resistance to the current. The mandibles are very large and strong, and a remarkable brush of long whisker-like spines protrudes from the mouth-parts at each side of the head. Dr. Barnard suggests that these modifications of the mouth-parts would seem to form a wide-spreading net or basket for the capture of particles of food brought down by the current. There are five pairs of double gills on the abdominal segments 2—6, and these differ markedly from those of the mud-dwelling *Austrocaenis capensis* nymph in which the gill membranes are protected by elyroid covers.

The general colouration of the *T. discolor* nymph is dark sepia-brown, with varied mottlings. The male nymph is up to 6—7 mm. long and the female up to 9—10 mm. long, and the tail cerci are as long as the body.

In Dr. Barnard's opinion the flat ventral surface of this nymph, when pressed closely to the surface of a stone, is most probably made to function as a vacuum by retraction of the central portions; the flattened femora also aiding in the adhesion. When the front legs are held forwards, the head tucks neatly under the concave edges of the femora for better streamlining, and numerous club-shaped spines on the legs and tail cerci abut against irregularities of the surface of the stones and help to stem the nymph against the push of the water.

The nymphs are slow crawlers and poor swimmers and are found in the greatest numbers under stones in the most permanent and torrential channels in the river, rarely in the deep pools and slack water. In such channels in the Hex and upper Breede rivers, which can only be examined at low water, the nymphs are often very abundant, all sizes from minute instars to those almost ready to "hatch" living together.

It has been noted that it is difficult to remove a Tawny Yellow (*Afronurus*) nymph from a stone, as it is similarly adapted for clinging, as well as being a very rapid mover. The sluggish *T. discolor* nymphs are even more tenacious in their grip on their chosen surfaces. It was found to be almost impossible to wash them off a stone that had been lifted out of the river, once they had "got set".

The method of collecting live specimens was to use a small camel's-hair brush, and wait for the creature to raise its head or tail end so that the hairs of the brush could be pushed under it. When a number were placed in a jar of water, they clung together in a tight scrum—one mass of the size of a pigeon's egg hung together for hours. The nymphs could not be retained alive in still water for more than fourteen days, but "breeding out" in captivity was unnecessary in this case as the subimagos could be correlated with the nymphs on the river stones; and, as related, it was possible to observe the short continuance of the winged stages and the massed nuptial flight of the spinners over the water.