

edge of comb seven and five on comb eight. Queen cocoons are about 10 mm long and 5 mm in diameter.

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Manuscript received March 10, 1969.

New records of rare ephemeropterans in the
Komati River system, Eastern Transvaal

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During an intensive study on the distribution of some Ephemeroptera in the Komati River system, Eastern Transvaal, some specimens rare to the Transvaal were found. The survey was carried out during the autumn, winter and spring of 1966 and summer of 1966/67.

Dicromyza costale Kinnmins, 1957

According to Kinnmins (1955, 1957) this species is fairly well represented in Equatorial Africa. The only South African representatives on record so far were collected by Venter (1961) in the Olifants River and Klipspruit system near Witbank, Transvaal, during 1959/60.

The nymphs of *Dicromyza* collected in the Crocodile and Sabie rivers are similar to those of *D. costale* as described by Kinnmins (1957) and their mouth-parts show the same agreement.

In the Crocodile River the nymphs were collected about two km. west of Kaapmuiden (350 m. above sea level) below the point where the Cape River joins the Crocodile River. They were found on the under surface of floating leaves of the marginal vegetation in a current speed of 0.190 m./sec. Specimens were found only during summer (12/1/1967). The water temperature was 25.2°C and the pH value and conductivity were 8.2 and 1250 mmho's respectively.

In the Sabie River collections were made during the same seasons as mentioned above and here too nymphs were found only during summer (16/1/1967). They were collected at 390 m. above sea level where the Sabie River enters the Kruger National Park. As in the Crocodile River they were found in the marginal vegetation. The current speed was 0.295 m./sec., water temperature 24.0°C, pH 7.7 and conductivity 760 mmho's.

The habitat preference of *Dicromyza* spp. seem to differ from that of other Tricorythidae found in the Komati River system. *Macchadorythus palanguin* Demoulin and *Neurocentis* spp. were found to be exclusively bottom-dwellers while *Dicromyza*

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spp., according to notes published by Kimmins (1957) and Venter (1961) and my own observations, occur in marginal vegetation as well as underneath, behind or on top of stones in rivers flowing slowly to cascading rapids.

Choroterpes nigrescens Barnard, 1932

Though abundant in the South Eastern Cape (Barnard, 1932), *C. nigrescens* was found only at one locality in the Komati River system. During October, 1966 five specimens per sq. m. were counted in the Boesmanspruit on the farm Roodepoort, approximately 10 km. west of Carolina. This sampling point is about 1550 m. above sea level. Though small the stream has a constant flow throughout the year.

Barnard (1932) asserted that this species favours still water conditions. The same habitat conditions were observed at this sampling point. The specimens were collected under loose stones in 10 to 20 cm. water where no flow was measured. The water temperature on 14/10/1966 was 16.5°C, the pH value 7.8 and the conductivity 2200 mmho's.

Oligoneuriopsis lawrencei Crass, 1947

The only sampling point in the Komati River system were *O. lawrencei* was found, is 1860 m. above sea level about 5 km. south of Dullstroom in the Crocodile River on the farm Vally Spruit. In this part the river can hardly be classified as more than a small stream because it is near the uppermost part of the river.

According to Crass (1947) this species is quite abundant in some parts of Natal. He collected as many as 20 individuals under one stone in a fast flowing stream. Only 22 specimens per sq. m. were counted in the Crocodile River where they occurred under and among stones in a current speed of 0.802 m./sec. They were collected on 5/1/1967 when the water temperature was 18.5°C, the pH 7.7 and the conductivity 86 mmho's. The basic habitat conditions agree with these described by Crass (1947).

Machadorythus palanquim Demoulin, 1959

This species was found in Portuguese Angola and described from the nymph by Demoulin (1959). Since then very little has become known about the ecology of *M. palanquim*.

In the Komati River system it was found at the localities and habitat conditions as noted in Table 1. The population densities varied from five individuals per sq. m. in a gravel substratum at a water flow of 0.265 m./sec. (Crocodile River, Kaapmuiden) to 89 per sq. m. in a sandy bottom in the South and North Cape rivers. A fairly wide temperature range was measured for this species, namely from 12.9 to 28.9°C over an area between the following three points: latitude 25°38' south and longitude 30°50' east; latitude 25°40' south and longitude 31°44' east; and latitude 25°05' south and longitude 31°50' east.

Machadorythus palanquim gives preference to a habitat type of which the substratum consists of sand in shallow (approximately 10 to 20 cm. depth), still or very slowly flowing water. No organisms were seen exposed on top of the sand and it is thus possible that they dig partly or completely into the sand. Support for this possibility is provided by the structure and position of the gills (described by Demoulin, 1959).

No adults of this species were bred and its abundance in the Komati River system provides a favourable opportunity to rear nymphs to the adult stage.

TABLE 1. Localities, dates of collections and habitat conditions where *Machadorythus palanquim* was collected

River	Sampling point	Height above sea level in meters	Date	Habitat type	Water temperature in °C	pH	Conductivity in mmho's
Komati	Farm Tonga, Dist. Barber-ton	200	25/10/66	Sand bottom, still water about 10 cm. deep	25.4	7.5	85
Crocodile	Crocodile Bridge on southern border of Kruger National Park	210	18/1/67	Sand bottom, slowly flowing water 0.8 m. deep	28.9	7.8	112
Sabie	Kaapmuiden	350	7/7/66	Gravel bottom, water flow 0.265 m./sec., 10 cm. deep	17.3	7.7	185
	Where river enters Kruger National Park	390	13/7/66	Solid rock, still water about 10 cm. deep	17.5	7.9	114
	Perry's Farm, Dist. Nels-pruit	520	12/7/66	Sand bottom, shallow still water	18.8	7.8	39
North Cape	Farm Worcester, Dist. Nels-pruit	820	7/7/66	Sand bottom, still water about 15 cm. deep	20.1	7.6	48
	Farm Inloop, Dist. Barber-ton	910	15/10/66	Sand bottom, still water about 10 cm. deep	18.5	8.3	111
South Cape	Farm Inloop, Dist. Barber-ton	910	7/7/66	Sand bottom, still water about 15 cm. deep	12.9	7.5	57

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Manuscript received March 12, 1969.

The biology and parasites of *Oditis artigena* Meyr. (Lepidoptera: Xyloryctidae) on coffee in Kenya.

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SUMMARY

Oditis artigena Meyr. is a minor pest of *Coffea arabica* in the East Rift area of Kenya. The larvae skeletonize and also eat out irregular holes from within their webs on the under surface of the leaves.

The egg, larval, pupal and adult stages are described. The complete life-cycle takes about 90 days at 23.5°C.

The most important parasites are *Microlycus* sp. and *Elaemus flaviceps* Ferr. Two species of *Pedibus* are important hyperparasites attacking both Chalciid and Ichneumonoid members of the parasite complex.

INTRODUCTION

Oditis artigena Meyr. was first recorded as a leaf-eater on *Coffea arabica* L. in Kenya in 1920 (Anderson, 1927). Since then it has been seen at irregular intervals on estates in the Kiambu, Ruiri and Thika districts of the East Rift region of Kenya. It is of minor overall importance as a pest but may, at times, cause serious localised damage. Small outbreaks occurred in Kiambu and Thika from late 1966 to mid-1967 and the opportunity was taken to study the pest and its natural enemies in some detail as nothing was known about its life history except for the brief information given by Anderson (1927). *O. artigena* has not been recorded from coffee in Tanzania or Uganda and the only other published record is that of Meyrick (1914) from South Africa who first described the species as *Xylorycta artigena*. *O. sembrunna* Brad. is a rare borer of the fruit of *C. arabica* in Kenya (Bradley, 1959) and *O. microbolista* Meyr. and *O. siccharis* Meyr. are recorded (Le Pelley, 1959) as leaf-eaters of coffee (probably *C. rubusta*) in Uganda. Members of the genus *Oditis* appear to be of little economic importance as pests of crops such as apples in Japan (Okamoto, 1939; Kondo *et al.*, 1931) and *Oditis* sp. on cocoa in Ghana (Smith, 1965).

METHODS

The observations on the life history of *O. artigena* were carried out in an indoor insectary. The temperatures prevailing are quoted where appropriate.

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