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FIRST REPORT OF THE NYMPH OF *NEOPERLA* NEEDHAM, 1905 (PLECOPTERA: PERLIDAE) FROM ILE-IFE, SOUTHWESTERN NIGERIA

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ABSTRACT
The nymph of the stonefly genus *Neoperla* Needham (1905) is reported for the first time from Ile-Ife in Osun State, southwestern Nigeria.

Keywords: Afrotropical Region, Plecoptera, Nigeria, *Neoperla*

INTRODUCTION

The taxonomy of aquatic insects in Nigeria has received little attention over the years in spite of the considerably diverse fauna in its freshwater bodies. However a few orders such as Odonata and Ephemeroptera have received some attention in the past (Gillies 1980, 1988; Hassan 1981; Ogbogu 2001). Information in literature on the Nigerian stonefly fauna is sparse. Only one genus is listed in Medler's (1980) checklist, which is based on Hynes' (1952) review of adult Neoperlinae from Africa. In a recent survey of macroinvertebrates, some nymphs of a stonefly belonging to the Family Perlidae were encountered for the first time in one of the streams in Opa River drainage basin in Ile-Ife, Nigeria.

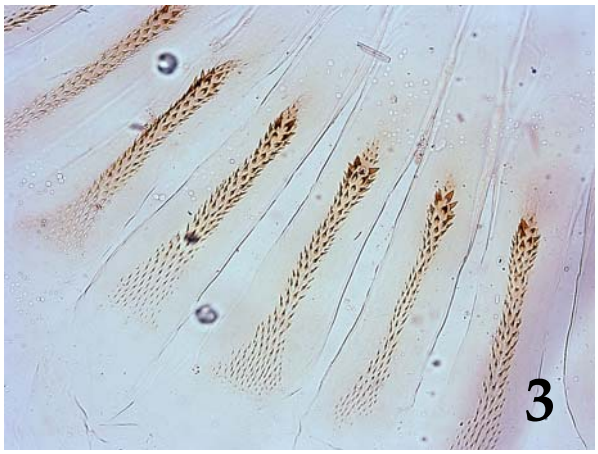
The genus, *Neoperla* Needham (1905) belongs to the Perlidae and is thought to have originated in the Oriental region (Sivec at al. 1988). Its range of distribution includes areas in North America (Stark & Baumann 1978; Stark & Lentz 1988; Stewart & Stark 2002), Asia (Stark 1987; Sivec & Zwick 1988; Sivec et al. 1988; Zwick 1988; Yuzhou 2000), and Afrotropical region (Zwick 1973b, 1976a & b). Of all the records of *Neoperla* from the Afrotropical region, no species was described from Nigeria unlike in other West African countries such as Cameroon, Ghana, Ivory Coast and Sierra Leone (Hynes 1952; Zwick 1973b).

The present study has the objective of describing the morphological features of the nymphs, with the aid of illustrations and identification keys existing in literature. This study is important because although it is a description of an unknown species, it is the first time the nymph of the genus has been recorded from Nigeria, from where adults have earlier been collected (Hynes 1952). It would also add to the knowledge of the range of geographical distribution of *Neoperla* in the Afrotropical Region.

***Neoperla* Needham (1905)**, (Figs. 1-3)
Neoperla Needham, 1905, p. 108.

Material examined. The specimens (mature nymphs) examined were collected by Elo Okeze from a stream that cross Ede road at a distance of 1km below Opa reservoir in Obafemi Awolowo University, Ile-Ife, Osun State in southwestern Nigeria (2.12.2004, 007°30.2'N, 004°31.8'E; 141m). The stream is shaded, with gravel bottom and varying seasonal water current velocity. One specimen was stored in 70% ethanol and has been deposited in the Natural History Museum (NHM) at Obafemi Awolowo University, Ile Ife, Nigeria. To observe the morphological features of nymph, one specimen was whole-mounted on a slide in Canada balsam and viewed under the microscope. Further observations were made with the microscope on fresh specimens as well as those preserved in 70% ethanol.

Fig. 1. *Neoperla* sp. larva. Head and pronotum, dorsal view.



Figs. 2-3. *Neoperla* sp. larva. Proventriculus armature.

Diagnostic characters of larva. *Neoperla* nymphs are relatively distinctive at the generic level by virtue of their two close-set ocelli and the occipital spinule row which transverses over head forming an elevated ridge behind the ocelli. Species level identifications, at least at present, require adult specimens. Figure 1 shows the head and pronotal pattern and Figures 2-3 show the proventricular armature for an undetermined specimen. The latter character has been shown to have some potential for recognition of perlid nymphs by Stark & Gaufin (1976).

DISCUSSION

The genus *Neoperla* has been recorded from several countries in the Afrotropical region (Hynes 1952, 1953, 1969; Tjonneland 1961; Zwick 1973a, 1976a, b; Picker 1980) and the species *N. spio* is reported to be widespread (Needham 1920; Picker 1980). In the checklist of *Neoperla* from South Africa (Villet 2000), three species are recognized, two of which are unknown and recorded as *Neoperla spp. 1* and *2*. The difficulty in the identification of specimens down to species level may be linked to the problem arising from the possible existence of a species complex among the Afrotropical region *Neoperla* (Hynes 1952; Picker 1980). The occurrence of species complexes appears to be a common phenomenon in the genus as has been observed in *N. clymene* (Stark 1990; DeWalt et al. 2002) and *Neoperla montivaga* (Zwick 1983, 1986). Recently, Zwick (2003) suggested many morphospecies may be widespread across Africa, and noted that there are examples of differences in similar specimens from different regions. Arising from this, Zwick (2003) suggested two possibilities: 1) geographic variation between conspecifics and, 2) close relationship between different species of *Neoperla*. In line with Zwick's (2003) suggestion it can be inferred that contrary to the belief that all African *Neoperla* belong to one extremely variable *N. spio* (Hynes 1952), there may be a number of species that are unknown. Moreover, known species may have wider geographical ranges in the Afrotropical region than are currently thought. This is possible given at least some American species of *Neoperla* are univoltine and can survive even in unusual habitats such as temporary streams (Stewart et al. 1974). *N. spio* has been observed in open shores of large lakes such as Lake Nyasa in addition to its occurrence in cool, forested streams elsewhere (Hynes 1976). Further examination of nymphs and adults of *Neoperla* from Nigeria is needed to determine whether they are those of *N. spio* or some entirely different species.

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