3. MATERIALS AND METHODS

Materials.

The present revision is based on the study of several hundred specimens of *Gonatocerus*. While a majority of these specimens have been collected by me during the period 1990-1994 from several States of India, some of these were, however, collected by other workers during the last 25 years, and were made available to me for this study (see 'Acknowledgements'). In addition to this, the types of twenty-four out of thirty-four nominal species of *Gonatocerus* from India, and types and determined material described by Sahad (1982), and Sahad & Hirashima (1984) and obtained from KUF, and that described by Matthews (1986) and obtained from the BMNH, were also studied. Types of *G. longicrus* Kieffer and *G. nigroides* (Narayanan & Subba Rao) were not available and are presumably lost. Specimens (?Types) of the three species described by Shamim & Shafee (1984) were also studied. Types of 6 species described by Subba Rao (1989) and present in the BMNH were not examined as the original descriptions supplemented with the notes made from the holotypes by Dr. M. Hayat during his visit to the Natural History Museum, London, in 1992, were found to be adequate for the recognition of these species.

A majority of the specimens were collected by sweeping with a net and hence their hosts are not known. However, this is with the exception of those few cases where the specimens were reared from the eggs of known hosts.
Males generally outnumber the females in samples collected by sweeping; but, they have not been studied here in detail because it is difficult to associate the sexes correctly in the swept material. These are described only when both the sexes were reared from known hosts.

Methods.

The following methods were used here for the detailed study of the mymarid specimens:

Preparation of card mounts. It is generally found difficult to correctly identify a Gonatocerus, or for that matter any other chalcidoid, to its species or even sometimes to its genus, if the specimens are preserved in alcohol. The situation becomes all the more worse if they are kept in alcohol for some years at room temperature. Therefore, while freshly collected specimens were usually killed in ethyl acetate fumes, and directly mounted on rectangular cards using water soluble glue following the techniques of Noyes (1982), those others which had been preserved in alcohol were subjected to critical point drying after which they were mounted on the cards.

These card mounted specimens were used for the description of body colour and for measuring the total length of the body.

Preparation of permanent slides. Specimens were cleared and mounted in Canada balsam on glass slides using the
method given by Noyes (1982). Noyes' (1982) method for slide preparation was preferred here over other methods as it has double advantage of clearing the specimen so as to make it possible to see all the details of setation and sculpture, and the well established permanency of balsam. These slide mounted specimens were used for the detailed study of setation, sculpture, and internal structures like the ovipositor. They were also used for measuring the dimensions of various sclerites. It can be mentioned here that some of the slide mounted material made available to me for study consisted of uncleared or partly cleared specimens.

Depending on the number of specimens available, one to several slides were prepared for each species. However, when only a single specimen of a species was available this was partly dissected and mounted on a slide after the body colour and other details had been recorded.

SEM. For scanning electron microscopy the specimens were dehydrated in ascending grades of alcohol and then subjected to critical point drying. These were then glued to stubs with sticky copper tape and finally gold coated. Scanning electron micrographs were taken with Hitachi, S-2300 scanning electron microscope.

Drawings. Drawings of various structures were made from slide preparations with the help of a drawing tube attached to a compound binocular research microscope (Nikon,
Measurements. Relative measurements of various body parts were made from the slide preparations with the help of an ocular micrometer having a linear scale of 100 divisions, placed in the eye piece of a compound microscope.

Total length of the body was measured usually from carded specimens with the help of a calibrated linear scale ocular micrometer fitted in the eye piece of a binocular microscope.

Descriptive methods. The descriptions and redescriptions of the species and other relevant taxonomic information is presented in the following sequence:

(i) Original citation as well as subsequent citations. (ii) Description or redescription of the species. This is presented in a standard sequence. Characters of the genus and species-groups are usually not repeated in the descriptions but exceptions are always noted. For example presence of 4 setae instead of the usual 2 on the mid lobe of the mesoscutum, presence of setae on anterior scutellum, presence of 2 setae instead of one on each side of propodeum behind spiracle. (iii) Relative measurements are given separately for the holotype followed by those of paratypes and/or additional material studied by me. (See "Terms and Measurements"). (iv) Hosts. Only hosts known from India are listed. (v) Distribution. Extralimital distribution is
given in parentheses. (vi) Material examined. (vii) Comments. These include notes on the synonymies proposed, and also a discussion on the relationship of the species.