by the barium-hydroxide-saline-Giemsa (BSG) technique of Sumner[3] with minor modifications. Slides were kept in saturated barium hydroxide for 15 minutes at room temperature, briefly rinsed in 0·02 N HCl and distilled water, and air dried. After incubating in 2 XSSC at 60–65° C for 3 hours in a petri dish, briefly rinsed in distilled water, stained in buffered (pH 6·8) Giemsa and mounted in DPX.

In the spermatogonial metaphase plate (Fig. 1) the C-bands can be clearly made out at the centromeric regions. The C-bands of different chromosomes are of similar size. Along with this, there are C-positive less dense telomeric blocks. The C-bands are conspicuous at the centromeric regions during diplotene (Fig. 2). The anaphase-I chromosomes also show distinct C-bands which are represented in the form of two dots (Fig. 3). The present observation on the double nature of the centromeric dots (bodies) at anaphase-I supports the earlier findings[4] that the division of the kinetochore starts at metaphase-I and accomplished at anaphase-I. This observation corroborates the heterochromatin studies on the grasshopper *Bryodema tuberculata*[5]. Further, the present studies have confirmed the telocentric nature of the chromosomes of *Acrida turrita*[6].

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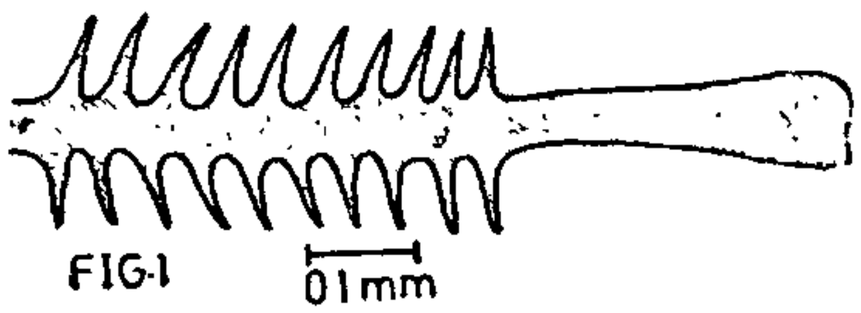
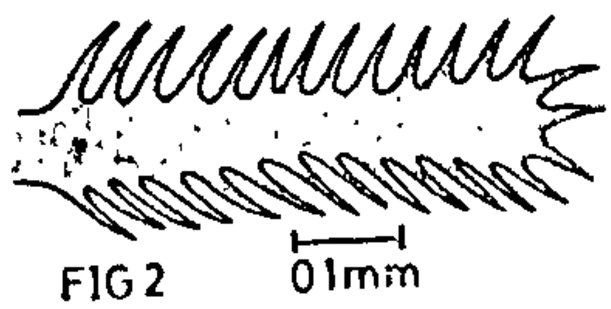
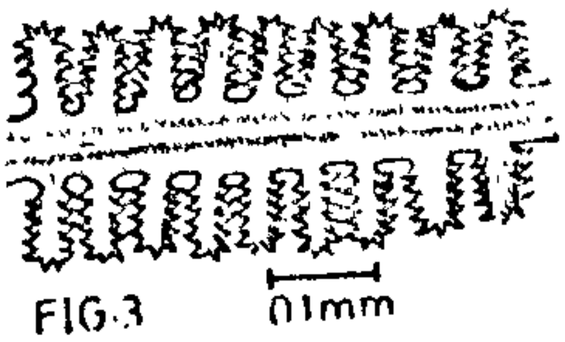
ON THE SHEDDING OF GILL RAKER PROCESSES IN GRAY MULLETS (FAM. : MUGILIDAE)

THE possible shedding of gill raker processes in grey mullets has already been indicated[1] and in the present note, additional evidence for such shedding is indicated.

In the general teleostean plan, gill rakers are bristle-like structures in double rows, occurring along the inner margin of hypobranchial, ceratobranchial and epibranchial of the first three arches and on the fourth and fifth gill arches where the ceratobranchial of the fifth arch is further modified to form the inferior pharyngeal. Luther[1] described the morphology of the gill raker processes of the first four arches and the ceratobranchial of *M. cephalus* but the present study on *M. cephalus* showed many variations and finer details which he has not dealt with. A full description is therefore added here as further information. In the first arch, the gill rakers of the outer row are very long while those of the inner row are very short. In the second arch, the rakers of the inner row are about half in size of those of the outer row. In the third arch however they are nearly three quarters in length whilst in the fourth arch (ceratobranchial) the rakers in the inner and outer rows are equal in size. The fifth ceratobranchial (inferior pharyngeal) displays a concavity wherein parallel rows of gill rakers, equal in size, are present. The gill rakers of the first gill arch are beset with tiny processes called the primary processes in double rows on the inner face except near the distal region (Fig. 1) whereas in other arches these primary processes are present even distally (Fig. 2). On the inner sides of the gill rakers are present (excepting in the first arch)







FIGS. 1–3. Fig. 1. Gill raker of the first gill arch with primary processes except on the distal end. Fig. 2. Gill raker of the other arches (2–5) with primary processes. Fig. 3. Strip of gill raker process with secondary and tertiary processes.

the strips, each one of which is made up of two filaments joining at the mid-dorsal line and forming a groove midventrally which fits on the gill raker. Each strip in turn bears tiny lateral processes called secondary processes and these further bear tertiary processes on both sides, thus leading to the formation of a very complex sieving apparatus (Fig. 3). Fleshy lobes were reported to be present on the distal ends of the gill rakers of the third, fourth (ceratobranchial) and fifth (inferior pharyngeal) but this could not be observed in the present study.

During investigations on the feeding of mullets in Vellar estuary, gill raker processes were found to occur commonly in their stomachs. Observations on the branchial baskets of large number of mullets showed that some had loosely arranged gill raker processes while in some they were absent. Luther[1] suggested the possibility of shedding of the gill raker processes particularly from the third arch onwards, due to their clogging with copepods and detritus during the rainy period (from October to December) in Mandapam area. In order to throw more light on this, acclimatised specimens of *Mugil cephalus* and *Liza macrolepis* (10–12 cm), collected from Vellar estuary, were introduced into two aquaria containing filtered estuarine water (using bolting silk cloth No. 20) mixed with inert animal charcoal powder. After 24 hours, the water from the aquarium was filtered and the residue was washed with filtered water. When the residue was examined under the microscope, small strips of gill raker processes could be seen. The branchial basket of the experimental fish, on examination, showed an accumulation of the charcoal powder over the gill raker processes, clogging them. Strips of gill raker processes were found to be dislodged and some portions were missing. It is therefore inferred that grey mullets, under the conditions of clogging of their gill raker processes, may shed them. Clogging occurs in all the other arches excepting in the first, since the first arch is not efficient in sieving (as described earlier). According to Luther only the third, fourth and fifth arches shed the gill raker processes but presently all the arches excepting the first are found to shed them.

It should be very interesting to study the regeneration of the gill raker processes, the feeding efficiency and the physiological state of the fish after the shedding the gill raker processes.

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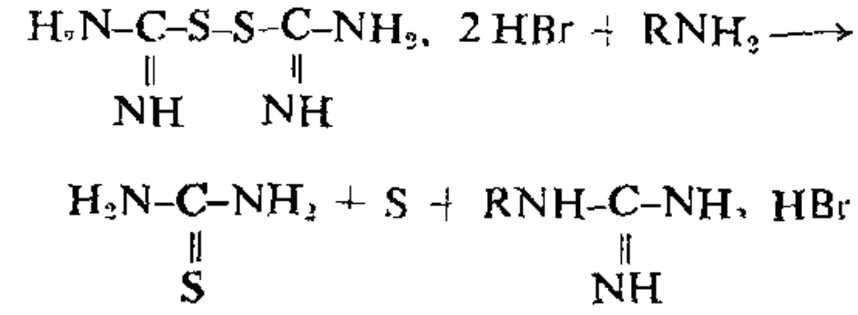
A CONVENIENT METHOD FOR THE PREPARATION OF MONOSUBSTITUTED GUANIDINES

VARIOUS methods for the synthesis of monosubstituted guanidines are reported in the literature but many times yields are poor and purity is not upto the mark. Also, in view of the facts, that guanidine derivatives possess high degree of biological activity[1-2], it was thought worthwhile to prepare these monosubstituted guanidines by some quick method resulting in high yields.

Bisformamidine disulphide salt on treatment with slight excess of molar proportion of primary amines afforded corresponding monosubstituted guanidines in high yields. The reaction can be depicted as follows :



where R = aryl or alkyl group.

Experimental

Bisformamidine disulphide dihydrobromide used in the synthesis of these guanidines was prepared according to the method reported in the literature[3].

Preparation of phenylguanidine.—Bisformamidine-disulphide dihydrobromide (10 g ; 0·032 mol) and aniline (4 g ; 0·043 mol) were mixed thoroughly and the reaction mixture was heated on a water bath for 3–4 hrs. The syrupy mass thus obtained was dissolved in water and then filtered. To a clear filtrate, sufficient quantity of sodium bicarbonate was added. The guanidine carbonate thus obtained was washed with ether and finally with small amounts of alcohol to remove the impurities and unreacted aniline also.

Similarly other guanidines were prepared. In some cases picrates were isolated (Table I).