PHYLOGENETIC CONSIDERATION
Hora (1937) and Menon (1974) have shown that the schizothoracine fishes are primitive as is evident from the fossil records available from Kashmir. They opined that these fishes whose fossils are known from the Karewas of Kashmir have probably spread along the Himalayas and further westwards during the second interglacial period, for better survival. Hora (1937) considered Schizothorax esocinus (Schizothoracanthus esocinus) to be the most primitive which existed in the lakes of Kashmir long times back and opined Oreinus (Schizothorax) to be its specialized form. It is probable that in the ancient times, the fishes with a terminal mouth and having a
piscivorous habit as exemplified by *Schizothoracichthys esocinus* must have faced a difficulty to compete for food with the fishes of that area. From then onwards, the fishes might have started shifting towards the feeding on dead organic matter settled at the bottom. This habit led to the use of the pectoral and the pelvic girdles for adhering to stones. The more evolved forms like *Schizothoracichthys microophorus* and *Schizothoracichthys labiatus* developed a slightly aterminal mouth which would have enabled these fishes to feed on the dead organic matter as well as on bottom dwelling insect fauna. In *Diptychus maculatus* and *Schizopygopsis stoliczkae*, the position of the mouth still shifted ventralwards till a position found in *Schizothorax* was attained.

From the present osteological studies, it is quite apparent that due to the presence of the opisthotics and three rows of pharyngeal teeth, i.e. 5, 3, 2-2, 3, 5, the forms like *Schizothoracichthys* and *Schizothorax* can be considered as primitive. By the absence of opisthotics and the presence of two rows of teeth, i.e. 4, 3-3, 4, *Diptychus maculatus* and *Schizopygopsis stoliczkae* can be considered as their specialized forms. However, in *Ptycobarbus conirostris*, the opisthotics are present but the pharyngeal teeth are in two rows, i.e. 4, 3-3, 4.
Thus, *Ptycobarbus conirostris* can be considered intermediate between *Schizothorax* and *Diptychus*, always considering *Schizothoracichthys* to be at the lowest level. The diagrammatic phylogenetic tree of the schizothoracine fishes can be deduced as follows:

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   Schizothoracichthys
     \           / Schizothorax
      /           \\
   Diptychus
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Ramaswamy (1955) and Menon (1974) considered *Aspidoparia* as a cyprinine genera. However, others like Misra (1962), Hora and Meokerjee (1970) and Gosline (1975) considered *Aspidoparia* as a rasborine genera. The present author agrees with the views of the latter authors as the osteological characters enumerated below clearly indicate its close relationship with *Rasbora*, a rasborine genera:

1. Large supraorbital clearly touching the autosphenotic.
2. Parasphenoid, a thin strut of bone.
3. Third suborbital being the largest.
4. Supraethmoid with a deep notch.
5. Tripus long, dorsal rib of first vertebra extremely reduced, parapophysis of the fourth vertebra feeble and directed ventroanteriorly.

Amongst *Aspidoparia morar* and *Rasbora daniconius*, the former appears to be slightly advanced over the latter as is evidenced by the following characters.

<table>
<thead>
<tr>
<th>Aspidoparia</th>
<th>Rasbora</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep but less wide groove of supraethmoid, kinethmoid</td>
<td>Deep, saucer-shaped groove of supraethmoid, kinethmoid</td>
</tr>
<tr>
<td>rod-shaped, pharyngeal teeth 4,4,2-2,4,4.</td>
<td>triangular, plate-like, pharyngeal teeth 5,4,2-2,4,5.</td>
</tr>
</tbody>
</table>

The present work further suggests that *Garra lamta* which is presently considered under the subfamily Cyprininae (Ramaswamy, 1955; Misra, 1962) can safely be placed in the subfamily Garrae as opined by Smith (1945) and Nath (1980); while separating *Garra* in the present study, Ramaswamy’s osteological studies of *Garra mullya* (1952) have also been taken into account. The following characters which can lead to its separation from the family Cyprininae are as follows:

1. Skull dorsoventrally compressed.
2. Supraethmoid notch completely absent.
3. Preethmoid on the anterolateral side of prevomer.
4. Prevomer wide anteriorly.
5. Parasphenoid much broad anteriorly.
6. Pharyngeal plate extremely reduced with pointed pharyngeal process.
7. Maxillaries characteristically with two condyles and absence of any crochet-shaped process of the maxillaries.
8. Parapophysis of the fourth vertebra not ventrally directed, ossa suspensoria splint-like meeting over the centrum of the fourth vertebra.
9. Swim bladder extremely reduced.
10. Coraco-cleithral fenestra much reduced and the pectoral symphysis much broad.
11. Basipterygial plates broad and strong, enclosing a small lateral fenestra.

These characters are sufficient enough to erect a new subfamily Garrinae as has been suggested by Smith (1945) and Nath (1980). The characteristically ventral mouth with a thick, broad and strong sucker at the chin, dorsoventrally compressed head, complete absence of the notch in the supraethmoid are the characters sufficient enough from which it can be conjectured that the forms like Garra are more advanced than that of Labeo and Schismatorhynchus.
Furthermore except from the angle of inclination of the supraethmoid with the frontal, i.e. 85° in Schismatorhynchus and 30° in Labeo, the two forms show close similarity with each other in majority of the osteological characters. Thereby, it is further suggested and interpreted that amongst the three cyprinine genera studied, Garra is the most advanced form. Labeo and Schismatorhynchus appear to be closely related sister genera.

So far as the subfamily status of the three subfamilies is concerned, these three subfamilies have originated from monophyletic stalk of the family Cyprinidae. The subfamily Schizothoracinae is considered to be primitive having its independent origin near Rasborinae whereas Cyprininae also has its independent origin. The subfamily Garinae appears to be an advanced form of Cyprinidae. A diagrammatic phylogenetic tree of the subfamilies deduced is as follows:

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  Cyprinidae
   /|
  /  
Garrinae  Schizothoracinae  Rasborinae
   |      |
  |      |
Cyprininae
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