PART B
Monogeneans are capable of producing large number of eggs although relatively a few are carried in uterus at a time. Among the *Dactylogyrus* reported from Indian subcontinents, in most of the cases it has been seen that the eggs are oval in outline. None of them are reported to possess an operculum or operculum like structure. In a few cases presence of polar filament was noticed by the workers, however, a few of them were without any polar elongation. In no case more than one polar filament was recorded as far as eggs of Indian Dactylogyroidea is concerned. So far, presence of eggs in different species of genus *Dactylogyrus* Diesing, 1985 was noticed in following cases:

*Dactylogyrus catalius* Jain, 1959 (Fig.1) from *Catla catla* and *Labeo bata*. The eggs are oval, non operculated without polar elongation, measuring 0.02-0.025 × 0.01-0.015 mm.

*D. cirrhini* Jain, 1960 (Fig. 2) from *Cirrhina mrigala*, the eggs are large without operculum and polar filament measuring 0.05 × 0.33 mm.

*D. tripathi* Gussev, 1963 (Fig. 3) from *Punctius stigma*. These are oval, without operculum but with small knob like polar filament at one of its end. The size of egg is 0.02 × 0.015 mm. However,
the length of polar filament is 0.003 mm.

*D. seenghali* Jain, 1959 (Fig. 4) from *Mystus seenghala*. These eggs in this case are oval, thick shelled, non-operculated and without polar elongation.

*D. glossogobii* Jain, 1959 (Fig. 5) from *Glossogobius gluris*. It was further described by Agrawal and Singh (1982) from the same host. There are large oval eggs with polar filament and without operculum. The size of egg proper ranges from 0.050-0.052 x 0.02 mm. However, its polar filament measures 0.02-0.03 mm.

*D. multispiralis* Jain, 1957 (Fig. 6) from *Silondia silondia*. This is an oval egg with a blunt projection at its narrower end. The size of egg is 0.04 x 0.06 mm. However, the size of polar filament is 0.0015 mm.

*D. cauveryi* Tripathi, 1959 (Fig. 7) from *Punctius dubius*. There are large eggs, broadly oval in outline and with a small knob like polar filament at one of its end. The size of egg is 0.07 x 0.056 mm and the size of polar filament is 0.013 mm.

*D. chagunionis* Tripathi, 1959 (Fig. 8) from *Barbus chagunio*. This is an oval egg, without polar elongation and operculum measuring 0.03 x 0.021 mm.

*D. boli* Tripathi, 1959 (Fig. 9) from *Raimas bola*. It is an oval egg with a small filament at one of its pole. Though Tripathi (1959) mentioned about the presence of polar filament in the text but it is absent in his diagram. The size of egg is 0.21 x 0.012 mm.
Fig. 1. *Dactylogyrus catalius* Jain, 1960

Fig. 2. *D. cirrhini* Jain, 1960

Fig. 3. *D. tripathi* Gussev, 1963

Fig. 4. *D. seenghali* Jain, 1959

Fig. 5. *D. glossogobii* Jain, 1960

Fig. 6. *D. multispiralis* Jain, 1957

Fig. 7. *D. cauveryi* Tripathi, 1959

Fig. 8. *D. chagunionis* Tripathi, 1959

Fig. 9. *D. boli* Tripathi, 1959

Fig. 10. *D. calbasi* Jain, 1960

Fig. 11. *D. gobii* Tripathi, 1959

Fig. 12. *D. cirrhini* Jain, 1960
Fig. 13. *Neodactylogyrus calbasi* Jain, 1957
Fig. 14. *Paradactylogyrus thapari* Agrawal, 19
D. calbasi Jain, 1960 (Fig. 10) from Labeo calbasu. It was further described by Agarwal and Singh (1980) from Labeo bata. These are oval eggs measuring 0.036-0.037 × 0.025-0.03 mm. The size of polar filament ranges from 0.03-0.035 mm.

D. gobii Tripathi, 1959 (Fig. 11) from Glossogobius giuris. These are large oval eggs without an operculum and polar elongation measuring 0.06 mm in length and 0.05 mm in width.

D. cirrhini Jain, 1960 (Fig. 12) from Cirrhina reba. It is an oval thin shelled egg with a small and blunt projection at its narrow end and measures 0.07 × 0.046 mm in size. The size of polar filament is however 0.01 mm.

The other genera of subfamily Dactylogyrinae Bychowsky, 1933 are Neodactylogyrus Price, 1938; Dogielius Bychowsky, 1936; Falciunguis Achmerow, 1952; Microncotrema Yamaguti, 1958; Microncotrematoides Yamaguti, 1961; Paradactylogyrus Thapar, 1948; Thaparogyrus Gussev, 1973; and Dactylogyroides Gussev, 1963; have been reported from India time to time. But as far as the structure of egg is concerned, it is known only for Neodactylogyrus Price, 1938 and Paradactylogyrus Thapar, 1948.

Jain (1957) reported Neodactylogyrus calbasi from Labeo calbasu. It is thin shelled, oval egg (Fig. 13) with a blunt projection at the narrower end and measures 0.054 × 0.028 mm.

Paradactylogyrus thapari Agrawal, 1980 from Labeo rohita. The egg (Fig. 14) is oval in outline, without operculum and polar filament measuring 0.08-0.09 × 0.04-0.045 mm.
Fig. 15. *Bifurcohaptor minutum* Kulkarni, ‘

Fig. 16. *B. tripathii* Gupta and Sharma, 19

Fig. 17. *B. chauhani* Agrawal and Sharma
ANCYLODISCOIDINAE GUSSEV, 1961

A large number of fresh water Ancylodiscoides has been reported from Indian waters but as far as the reports regarding eggs are concerned, it is confined to the genera like *Sillurodiscoides* Gussev, 1973; *Mizelleus* Jain, 1957; *Bifurcohaptor* Jain, 1958; *Silonditrema* Tripathi, 1959; *Neosprostonia* Jain, 1959; and *Lobotrema* Tripathi, 1959.

Jain (1958) reported the genus *Bifurcohaptor* for the first time from Indian waters. This parasite is restricted to Indian waters only. The morphology of egg in this parasite is varied. In *B. minutum* Kulkarni, 1969 (Fig. 15) from *Mystus tengra*. The egg is oval in shape, double walled without operculum and polar elongation. The size of egg ranges from 0.027-0.033 × 0.04-0.06 mm.

*B. tripathii* Gupta and Sharma, 1981 (Fig. 16) from *Channa striatus*. The eggs are ovoid, thin shelled without any polar elongation and operculum and measures 0.065-0.071 × 0.05-0.052 mm.

*B. chauhani* Agrawal and Sharma, 1986 (Fig. 17) is said to possess a very peculiar type of egg which is found harbouring *Bagarius bagarius*. Egg is rounded in shape measuring 0.04-0.065 × 0.015-0.06 mm in size with polar filament at both the ends. The polar filament is simple, tubular and measures 0.06-0.13 mm in length. The eggs are diagonally placed between the vagina and receptaculum seminis (?)..

Tripathi (1959) reported genus *Lobotrema* for the first time from Indian waters. But the knowledge regarding the egg of this genus is
Fig. 18. *Lobotrema sciaeneae* Kumar and Agraw
Fig. 19. *Mizelleus indicus* Jain, 1957

Fig. 20. *M. chauhani* Agrawal and Sharm

Fig. 21. *Thaparoleidus wallagonius* Jain, 1

Fig. 22. *T. isotylus* Kulkarni, 1969

Fig. 23. *T. soham* Pandey and Mehta, 198
concerned restricted to *L. sciaeneae* Kumar and Agarwal, 1978 (Fig. 18) from *Sciaena coitor*. This parasite also has a very peculiar type of egg. The shape of egg resembles like a tulip flower, triradiate in outline, equipped with an elongated polar filament. The size of egg ranges from 0.048-0.060 x 0.042-0.045 mm. However, the size of polar filament ranges from 0.05-0.07 mm.

Jain (1957) erected the genus *Mizelleus* from Indian fresh water. This genus is also widely represented in India by different species but is restricted to Indian subcontinent only. Our knowledge regarding the morphology of the egg of this genus is restricted to two species only viz., *M. indicus*, the genotype and *M. chauhani* Agrawal and Sharma, 1988.

The egg in case of *M. indicus* Jain 1957 (Fig. 19) from *Wallago attu* is oval in outline, thin shelled, without polar elongation and operculum, measuring 0.066 x 0.041 mm.

*M. chauhani* Agrawal and Sharma, 1989 (Fig. 20) from *Wallago attu*. The egg is peculiar in its shape and other structural details. It was embryonated, yellowish in colour, quadrangular in outline with single elongated polar filament posteriorly. It has few yolk cells and measures 90-120 x 70-90 μm. The size of polar filament which is coiled ranges from 100-140 μm.

Jain (1952) described the genus *Thaparocleidus* from Indian waters. This genus is also widely reported from India but restricted to Indian waters only, so far the eggs are reported in three different species viz. *T. wallagonius* Jain, 1952 (genotype); *T. isotylus* Kulkarni,
Fig. 24. *Silonditrema vacha* Tripathi, 1959

Fig. 25. *S. yogendraii* Agrawal and Singh,
In case of *T. wallagonius* Jain, 1952 (Fig. 21) from *Wallago attu*. It is oval in outline, thin shelled with a conical projection at its broader end and measures 0.068 x 0.041 mm.

*T. isotylus* Kulkarni, 1969 (Fig. 22) from *Wallago attu*. It is also oval in shape measuring 0.055-0.061 x 0.041-0.047 mm. At broader end of this egg, there exists a hook like polar elongation.

*T. sohani* Pandey and Mehta, 1986 (Fig. 23) from *Wallago attu*. The egg is peculiar from the other two in absence of polar filament. It is oval in outline and measures 0.02 x 0.03 mm in size.

Tripathi (1959) described the genus *Silonditrema* from Indian waters. Different species of this genus has been recorded from Indian waters but the morphology of the egg is studied in only two species viz., *Silonditrema vacha* Tripathi, 1959 and *S. yogendraii* Agrawal and Singh, 1980.

In *S. vacha* Tripathi, 1959 (Fig. 24) from *Eutropiichthys vacha*, egg is large, oval in shape with a long polar filament measuring 0.035-0.043 x 0.025-0.031 mm while, its polar filament is 0.015-0.023 mm.

In *S. yogendraii* Agrawal and Singh, 1980 (Fig. 25) from *Clupisoma garua*, egg is single oval in shape with a long polar filament. It measures 0.06 x 0.03 mm while, its polar filament measures 0.54-0.58 mm.

Jain (1959) described the genus *Neosprostonia* also from Indian
Fig. 26.  *Neosprostonia indica* Jain, 1959

Fig. 27.  *N. wallagonia* Jain, 1959
Fig. 28.a.  *Urocleidus notopterus* Jain, 1951

Fig. 28.b.  *U. vachi* Tripathi, 1959
Fig. 29. *Quadriacanthus kohiensis* HaKy, 1968
waters. Morphology of the egg has been studied in two species of this genus viz., *Neosprostonia indica* Jain, 1959 and *N. wallagonia* Jain, 1959.

In *N. indica* Jain, 1959 (Fig. 26) from *Eutropiichthys vacha*, egg is single, oval in shape with a hook like posterior projection measuring 0.055 x 0.04 mm.

In *N. wallagonia* Jain, 1959 (Fig. 27) from *Wallagonia attu*, egg is single, thin shelled, oval in shape and it measures 0.06 x 0.048 mm.

**ANCYROCEPHALINAE BYCHOWSKY, 1937**

A large number of different genera of family Ancyrocephalinae has been reported from India but as regard the morphology of egg is concerned it is known for a very few genera like *Urocleidus* Muller, 1934 ; *Indocotylus* Kulkarni 1969 ; *Quadriacanthus* Paperna, 1961 and *Heteronchocleidus* Bychowsky, 1957 only.

In *Urocleidus notopterus* Jain, 1955 (Fig. 28a) from *Notopterus notopterus*, egg is single, oval in shape with a short blunt projection. It is found near the vagina and enclosed in a semitransparent uterus. It measures 0.071 x 0.04 mm (length without projection) while, the length of projection is 0.008 mm.

In *U. vachi* Tripathi, 1959 and Jain, 1961 (Fig. 28b) from *Eutropiichthys vacha*, egg is large, elliptical in shape and it measures 0.05-0.06 x 0.025-0.032 mm with a polar filament of 0.65-0.72 mm.

In *Quadriacanthus kobiensis* Ha Ky, 1968 (Fig. 29) from *Clarias*
Fig. 30. *Indocotylus micracanthus* Kulkarni, 1969
Fig. 31.  *Heteroncocleidus athari* Pandey and Mehta, 1986
Fig. 32. *Mazocraes chauhani* Kumar and Agarwal, 1981

Fig. 33. *Mazocreoides goniolosae* Tripathi, 1959
batrachus, egg is spindle shaped with long pedicle and small filament on the lid. The pedicle is with widened sucker shaped end. It measures $0.12 \times 0.05$ mm without polar filament and polar filament is $0.04$ mm in length.

In *Indocotylus micracanthus* Kulkarni, 1969 (Fig. 30) from *Mystus aor*, egg is single, large, roughly oval in shape and bears a terminal spine. It measures $0.058$ mm by $0.033$ mm.

In *Heteroncroleidus athari* Pandey and Mehta, 1986 (Fig. 31) from *Wallago attu*, egg is oval in shape without operculum and polar filament. It measures $0.018 \times 0.016$ mm.

**MAZOCRAENAE PRICE, 1961**


*Mazocraes chauhani* Kumar and Agarwal, 1981 (Fig. 32) from *Gudusia chapra* (Clupeid fish). The egg is oval in shape, yellow in colour with one small filament. It measures $0.025-0.050$ mm.

*Mazocreoides goniolosae* Tripathi, 1959 (Fig. 33) from *Ganiolosa manmnina*. The egg is oval in shape, thick shelled and without filament. It measures $0.15 \times 0.075$ mm.
Fig. 34. *Neomazocraes anadontostoma* Tripathi, 1959
Fig. 35. *Cribromazocraes llewellyni* Agrawal, 1991
Fig. 36. *Paramazocraes gorakhnathai* Agrawal and Singh, 1985

Fig. 37. *P. phasae* Tripathi, 1959

Fig. 38. *Heteromazocraes mamaevi* Agrawal and Sharma, 1988

Fig. 39. *Pseudomazocraeoides indicus* Agrawal and Sharma, 1987
Neomazocraes anadontostomae Tripathi, 1959 (Fig. 34) from Anadontostoma chacunda. The egg is oval in shape, thin walled, bearing a broad appendage of irregular shape at posterior pole. It measures $0.1 \times 0.013$ mm without appendage and the appendage measures $0.05 \times 0.044$ mm.

Cribromazocraes llewellyni Agrawal, 1991 (Fig. 35) from Hilsa ilisha. The egg bears two polar filaments. Excluding these filaments it measures $60-90 \times 35-55$ μm. Anterior polar filament is shorter and measures $50-60$ μm while posterior filament is very long, coiled and measures $100-250$ μm.

Paramazocraes gorakhnathai Agrawal and Singh 1985 (Fig. 36) from Labeo rohita. The egg is single, oval in shape with a single polar filament and measures $0.21 \times 0.11$ mm. Polar filament is long, its distal end is demarcated by a filament which measures $0.15-0.21$ mm.

Paramazocraes phasae Tripathi, 1959 (Fig. 37) from Setipinna phasa. The egg is fusiform and filamented. The filaments are present at both the ends of egg. One of the filament is blunt while the other is forked. The size of egg proper ranges from $0.174-0.188 \times 0.043-0.058$ mm. However, the size of polar filament ranges from $0.07-0.08$ mm and $0.04-0.05$ mm respectively.

Heteromazocraes mamaevi Agrawal and Sharma, 1988 (Fig. 38) from Securicula gora. The egg bears two polar filaments and excluding
Fig. 40. *Diplozoon cauveryi* Tripathi, 1959

Fig. 41. *D. soni* Tripathi, 1959

Fig. 42. *D. dasashwamedhai* Agarwal and Kumar, 1989
Fig. 43. Diplozoon tripathii Singh et al., 1994
Fig. 44. *Diplotrema barbi* Tripathi, 1959
these filaments it measures 70-100 × 20-50 μm. Anterior polar filament is smaller, straight, notched and measures 50-75 μm. Posterior filament is lanceolate and measures 100-130 μm.

*Pseudomazocraeoides indicus* Agrawal and Sharma, 1987 (Fig. 39) from *Hilsa ilisha*. The egg is conical at anterior end and measures 0.055-0.15 × 0.02-0.11 mm. At the posterior end of egg there is a plug like structure from which a highly coiled polar filament arises and forms several coils at the point of its origin, runs straight for a short distance and once again forms several coils. The coiling was quite peculiar and was difficult to measure.

**PROTOMICROCOTYLINAE Johnston and Tiegns, 1922**

In all three genera are known under the family protomicrocotylinae from the Indian waters. These are *Protomicrocotyle* Johnston and Tiegns, 1922; *Bilaterocotyle* Chauhan 1945; *Lethocotyle* Manter and Price, 1953 and *Bilaterocotyloides* Ramalingam, 1961. As far as, the anatomy of egg is concerned our knowledge is restricted to *B. lucknowensis* Agrawal and Sharma, 1986 (Fig. 46) from *Sciaena coitor*. The eggs are oval, operculated and measures 0.25-0.31 × 0.09-0.12 mm. It has two polar filaments. Each filament is simple, tubular, curved and measures 0.24-0.32 mm.

**DIPLOZOOIDAE Tripathi, 1959**

Family Diplozooidae is reported from different parts of the world and is represented by several genera. As far as, Indian genera are
concerned, the structure of egg is known in case of *Diplozoon* Nordmann, 1832 and *Diplotrema* Tripathi, 1959 only.

*Diplozoon cauveryi* Tripathi, 1959 (Fig. 40) from *Cirrhina cirrhosa*. Young eggs are without filament but mature eggs are with filament coiled. Each egg measures 0.26-0.27 × 0.1-0.116 mm.

*D. soni* Tripathi, 1959 (Fig. 41) from *Oxygaster bacaila*. At least two eggs present with a long coiled polar filament. Each egg measures 0.064 × 0.034 mm.

*D. dasashwamedhai* Agrawal and Kumar, 1989 (Fig. 42) from *Barilius bola*. The egg is simple and measures 0.0156 × 0.066 mm.

*D. tripathii* Singh *et al.*, 1994 (Fig. 43) from *Catla catla*. The eggs are oval in outline, thick shelled, non operculated and equipped with single polar filament. The size of egg ranges from 0.21-0.23 × 0.11-0.12 mm. The polar filament is highly coiled and at its distal most extremity is slightly swollen before terminating.

*Diplotrema barbi* Tripathi, 1959 (Fig. 44) from *Barbus chagunio*. The egg is oval with thick shell and a long filament at one pole. It measures 0.152 × 0.091 mm. while, egg filament measures about 0.3 mm. Two or three eggs present in the uterus which are without polar filament and operculum.

**MICROCOTYLINAES Monticelli, 1892**

The family Microcotylinae is widely represented by different genera like *Tripathia* Yamaguti, 1961; *Microcotyloides* Fujii, 1944; *Diplasiocotyle*
Sanders, 1944; *Microcotyle* Beneden and Hesse, 1863; *Aspinatrium* Yamaguti, 1961; *Gonoplasius* Sanders, 1956; *Cynoscionicola* Price, 1962; *Bivagina* Yamaguti, 1961 and *Yogendrotrema* Kumar and Agarwal, 1983. Out of these only three genera viz., *Tripathia*, *Microcotyle* and *Yogendrotrema* are known from the Indian waters. Moreover, our knowledge regarding the egg anatomy is restricted to *Yogendrotrema rajghatai* Kumar and Agarwal, 1983 (Fig. 45) from *Rhinomuquil corsula*. The egg is oval in outline, yellow coloured, operculated and without any polar filament. It measures 0.164-0.191 × 0.096-0.110 mm.
Types of monogenean eggs reported by earlier workers
(after Dawes, 1947)

a) Thaumatocotyle dasybatis
b) Udonella caligorum
c) Diplozoon paradoxum
d) Rajonchocotyls alba
e) Nitzschia monticelli
f) Squalonchocotyle apiculatum
g) Microbothrium apiculatum
h) Hexabothrium canicula
i) Erpocotyle laevis
j) Diclidophora denticulata
DISCUSSION

Earlier workers like Bychowsky (1957), Llewellyn (1957) while studying the monogenean eggs have indicated that the eggs are generally operculated. At one or both the ends, the eggs bear polar filaments which may be very long or short, straight or much coiled (Fig. 47).

Hargis (1955) reported that monogenean eggs in a few cases attach with the host specimens and which was later confined in various species by workers like Bychowsky (1957), Ktari (1977) and Kearn (1986).

Bychowsky (1957) differentiated these filaments into 'foot' extending from non-operculated end and 'filament' extending from operculated ends. He (1957) further classified the eggs into two chief types.

1. Which are laid in water and descend to the bottom or attached to an object during its descend.
2. Which adhere to host body itself.

Euzet (1957) proved the importance of filament and stated that filament should be studied in detail in as many species as possible.

Yamaguti (1961) while describing the general characters of monogeneans in the classical work "Systema Helminthum" reported that in case of monogenean eggs are relatively large and a few, occasionaly numerous, usually with a polar filament with or without operculum.

Khotenoveskii (1977) studied the life cycles of a few monogeneans
and reported that monogeneans are mostly oviparous, however, a few of them are viviparous. In case of oviparous monogeneans there are usually polar filament at one or both the poles for fixation of egg which are diverse.

Chappel (1979) made a comprehensive review of earlier works on monogeneans and reported that eggs are operculated with filament at one or both the ends. Egg shells are composed of tanned scherotin. Eggs are liberated in the water where they are presumed to sink or hatch though, the filaments may allow them to attach to a new host and hatch there (however, he stated that it is rare in occurrence).

As regard the hatching is concerned, it has received a great deal of attention and roles of temperature, light, pH, pCO₂, and pO₂ salinity have not been fairly determined (Chappel, 1979). However, light is an important factor which determines the development and hatching of eggs.

Kearn and Green (1983) studied the egg anatomy and its development in case of monogenean Squalotrema llewellyni in detail. In this case they reported that the eggs are tetrahedron with single filament called as appendage. Operculum is usually present which detaches on hatching of the parasite. The fracture line of operculum is not visible in most of the cases as it develops only after the out set of development during its late stages. Kearn and Green (1983) called the filaments of blunt ends as spur rather than filament and foot. (Llewellyn, 1957 and Bychowsky, 1957). They further pointed out
that these spurs are made of the same material of which egg shell is made and are hollow. The cavity which exists in them is communicated freely with the central cavity present in egg.

Kearn and Green (1983) reported that the flat blunt corners of eggs are to accommodate the operculum.

Kearn and Green (1983) while describing the variation in the shape of eggs opined it is due to selection pressure which finally have led to alteration in the shape of eggs.

Moreover, development of spur is in order to increase the surface area of egg shell to contribute to the gaseous exchange (Kearn and Green, 1983).

However, the function of coiled appendage which appears to have adhesive role is still obscure (Kearn and Green, 1983).

Ogawa (1984) studied the egg anatomy in monogenean, *Bendenia hoshinai* and reported that it is a tetrahedral egg with an elongated polar filament.

Kearn (1985) studied the eggs of *Entobdella soleae* Beneden and Hesse, 1864 and reported that egg output (oviposition rate) increases with the increase in size of parasite. Size of individual egg also increases with the increase in size of parasite. Shape of egg of any monogenean chiefly depends upon the shape of its own ootype complex. Operculum of shell is made in the distal corner of ootype complex which is found communicated with the uterus while the polar elongation is synthesized in proximal part of tube of ootype
complex which appears beaded due to the presence of Mehli’s gland (Kearn, 1985).

Kearn (1985) further stated that the colour of egg depends upon phenolic substances and enzyme phenolase which is responsible for tanning of egg shell and depends upon large number of factors.

Byrness (1986) reported that laid eggs of *Udonella* sp., attaches itself to the carapace of a copepod.

Hussey (1986) and Byrness (1986) stated regarding the validity and importance of study of monogenean eggs and opined that it is important to come out of taxonomic confusion at genera and family levels.

Whittington and Kearn (1991) studied the eggs and oncomiracidia of *Encotyllabe* spp. and opined that appendages play a vital role in the attachment of egg with either host or parasite.

Kearn et. al. (1992) made a comparative study of eggs of *Benedenia seriola* (Yamaguti, 1934) Price, 1939 and *Heteraxine heterocerca* (Goto, 1894) Yamaguti, 1938 and reported that although most of the monogenean eggs resemble roughly with each other but differ in its detail due to difference in invasion site and access to their different site may be optimal at different times of the day.

During the present investigation no definite taxonomic characters could be noticed in different genera of the families Dactylogyridae, Ancylodiscoidenae, Ancylocephalinae, Mazocraenae, Protomicrocotylinae, Diplozoooidae and Microcotylinae. Thus, it is no where important from
As far as the number of eggs in the uterus of fresh water monogeneans is concerned it was seen that never more than one egg is reported which confirms the findings of Yamaguti (1961).

It is difficult for the author to comment upon the rate of oviposition because she has not studied this aspect in any of the Indian parasites. Moreover, I agree with Kearn (1985) that the oviposition rate is directly related to the size of the parasite.

Significant size variation of the egg was noticed in different genera of the family Dactylogyridae, Ancylostoidenae, Ancylocephalinae, Mazocraenae, and Diplozoooidae. But it is difficult for the author to assign any reason for this intrageneric size variation of the egg but I agree with Kearn (1985) that the size of egg increases with the increase in the size of the parasite.

Difference of the shape of the egg appears to be one of the important findings of the present investigation in the different species of the same genera for which I agree with Kearn and Green (1983), Kearn (1985). Who proposed that the shape of egg is due to selection pressure which might have led to the alteration of egg shape and that the shape of egg depends upon the shape of ootype complex besides this, in my opinion it might also be due to the difference in the degree of the maturation of the parasite and its length.

As far as the colour of egg shell is concerned, these are reported to be yellow, brown, dark brown and some times black. On
this issue, I believe that the colour of egg shell depends upon phenolic substances and enzyme phenolase which is responsible for the tanning of the egg shell since, the enzymatic activity is involved therefore, it depends upon a large number of factors, therefore, no clear conclusion can be drawn unless the process of egg shell formation is studied by histochemical and cytochemical procedures. Earlier Chappel (1979) and Kearn (1985) have also drawn almost similar conclusions.

As regard the thickness of egg shell is concerned, it was reported that in a few cases it is very thin, single layered and sometimes double layered. At this juncture, it is difficult for the author to correlate her findings as no earlier worker in their work has taken account of it. But in my opinion, since the egg shell is the most vital structure for the respiratory requirement of the developing embryo inside the egg, therefore, the development of egg shell can be correlated with the macromilieu (a place where host lives) and micromilieu (a place where parasite lives).

Presence of operculum was noticed only in two cases of parasites, Quadriacanthus kobiensis Ha Ky, 1968 and Bilaterocotyle lucknowensis Agrawal and Sharma, 1986. In rest all reported eggs presence of operculum was not noticed by the workers. However Hargis (1955), Llewellyn (1965), Yamaguti (1961) and Kearn and Green (1983) reported that the presence of operculum is a must. Kearn and Green (1983) reported that the operculum fracture line is not visible in most of the cases as it develops after the outset of the development of egg to which I agree.
Presence of spur was noticed in large number of genera and their different species but most of the Indian workers called them as filament which is misnomier because these are made up of shell material, hollow in nature (as drawn by the workers in most of the cases) and their lumen is connected freely with the central cavity present in the egg. Since, every outgrowth from the surface of the egg having above mentioned characters are spur (Kearn and Green, 1983) therefore, all these should be called as spur and can be correlated with the micro and macro milieu of the parasite and host because Kearn and Green (1983) stated that the development of spur is in order to increase the surface area of egg shell to contribute to gaseous exchange.

Presence of polar filament in the monogenean egg was noticed in few cases. In some cases, they are roughly converted into hook like structure. Moreover, in few other cases, they are highly coiled. Since this feature is highly variable and is ment for the suspension and deposition of egg in the water as reported by Hargis (1955), Euzet (1957), Bychowsky (1957), Ktari (1977), Kearn and Green (1983), Kearn (1985), Byrness (1986), Kearn (1986), Whittington and Kearn (1991) and Kearn et. al. (1992). Therefore, its presence and absence and variation in the shape and sizes can be correlated with the oviposition, deposition and suspension of the egg.

Since no such consideration was made by the earlier workers while describing these texas, it is difficult for the author to draw any conclusion.