



INTERNATIONAL **J**OURNAL FOR **I**NNOVATIVE **R**ESearch IN
MULTIDISCIPLINARY **F**IELD

(ISSN: 2455-0620) (Scientific Journal Impact Factor: 6.719)
Monthly Peer-Reviewed, Refereed, Indexed Research Journal
Index Copernicus International - IC Value: 86.87

Special Issue of
International Web Conference on Recent Advances
in Freshwater Aquaculture (RAFA-2021)

Organized by
Department of Zoology M.S.P. Mandal's - Sunderrao Solanke
Mahavidyalaya, Majalgaon, Dist. Beed (M.S.) India

In Joint Collaboration with
Nepal Aquaculture Society, Kathmandu, Nepal (NEAQUAS)
Asian Biological Research Foundation (ABRF), Prayagraj, (U.P.), India
Glocal Environment & Social Association (GESA), New Delhi

21 - 22 January, 2021

Conference Special Issue



Conference Special Issue – 22

January - 2021



RESEARCH CULTURE SOCIETY & PUBLICATION

Email: rcsjournals@gmail.com
Web Email: editor@ijirmf.com
WWW.IJIRMF.COM



Research Culture Society & Publication

33	Legal Framework for Conservation of Forests in India - Dharmapurikar M. L.	137-140
34	Lipid Contents in the Freshwater Bivalve, <i>Lamellidens Corrianus</i> from Different Habitats - Gulbhile Shamsundar D., Maske Ranjit B. and Chavan Laxman N.	141-144
35	Modern Techniques in Aquaculture: Probiotics in Aquaculture - Deshmukh Jayshree Uttamrao	145-147
36	Morphometric Analysis of Watershed Area of Kalamkonda Reservoir, Hingoli District using Geographic Information System (GIS) - Markad Sandip, Patil Dhanaji and Gaikwad Jayprakash	148-153
37	Nanotechnology and Fishery: A Comprehensive Research Review - Dabhade Varsha Fakira	154-165
38	Occurrence of Tricladid and cladocerans from Lentic Water Bodies of Pune District, Maharashtra (India) - Kshirsagar Ravindra V.	166-169
39	On A New Species of Genus <i>Tetragonocephalum</i> (Shiple & Hornell, 1905) (Cestoda: Lecanicephalidea) From <i>Dasyatis Walga</i> from Dist. Raigad (M.S) India - Dongare Vasant and Ghoble Sachin	170-172
40	Physico-Chemical Analysis of Gulbheli River and Nalganga Reservoir, Nalgangapur, Dist. Buldana, Maharashtra State, India - Morey Chitra D.	173-182
41	Physicochemical Analysis of Thane Creek Water - Pekhale Sanjay T. and Varpe Vikas S.	183-188
42	Physico-Chemical Status of Water in Bhima River Near Solapur Dist. Solapur (M.S.) - Bhalkare Shashikala Laxman	189-191
43	Population and Behaviour of Waterfowl in Different Freshwater Body of Western Maharashtra - Abdar M. R.	192-195
44	Preliminary Survey of Birds in Terna Reservoir of Osmanabad in Maharashtra - Patil Satish and Jadhav H. K.	196-198
45	Recent Techniques Used in Fish Seed Production in Marathwada Region (MH) India - Rathod Sandeep R.	199-204
46	Record of Monogenetic Trematode: Parasites of Catfishes from Yieldari Reservoir, Parbhani District - Ishrat Parveen Mohd. Bari and Gaikwad J. M.	205-209
47	Seasonal Changes in Levels of Zinc and Mercury in Tissues of <i>Lamellidens marginalis</i> Collected from Sukhana Dam - Dahiwalé Bhausaheb J., Gulbhile Shamsundar D., Patil Satish S.	210-219
48	Seasonal Chlorophycean Diversity in Vijasan Lake of Bhadrawati, District Chandrapur (M.S.), India - Luharia N. M., Harney N. V. and Dhamani A. A.	220-222
49	Seasonal Infection of Tapeworms in Some Freshwater Fishes - Kale Sanjay S.	223-225
50	Seasonal Variation in Water Quality Parameters of Bendsura Reservoir Maharashtra - Sirsat P. B.	226-228
51	Status of Fishes in the Majalgaon dam Reservoir on SindphanaRiver, Godavari Basin in Maharashtra State, India - Ingole Sitaram B.	229-232
52	Studies on Composition of Zooplankton in Bindusara River Water at Beed, Dist Beed, Maharashtra, India - Jaysingpure V. M.	233-236
53	Studies on Fish Diversity of Khandala and Bori Reservoirs in Osmanabad District, Maharashtra. - Jadhav H. K.	237-238

Lipid Contents in the Freshwater Bivalve, *Lamellidens corrianus* from Different Habitats

Gulbhile Shamsundar D., Maske Ranjit B. Chavan Laxman N.

Assistant Professor, Department of Zoology, Vaishnavi Mahavidyalaya, Wadwani, (M.S.) India
Assistant Professor, Department of Zoology, Vaishnavi Mahavidyalaya, Wadwani, (M.S.) India
Assistant Professor, Department of Microbiology, Vaishnavi Mahavidyalaya, Wadwani, (M.S.) India
Email: sdgulbhile@yahoo.com

Abstract: The Freshwater bivalve, *Lamellidens corrianus* was collected from different localities and habitats of Marathwada region. Their gonads were screened for the determination of the sex by taking the smear from different regions and the data was prepared to study the sex composition. *Lamellidens corrianus* after screening for the sex showed males, females and few hermaphrodites. Variations in the food value with respect to lipid contents among various sexes from lentic and lotic environment were studied from dry powders of gonads and whole body by estimating lipid contents using the method of Barnes and Blackstock (1973). The results are given and discussed in the full-length paper.

Key Words: Lipid, *Lamellidens corrianus*, lentic, lotic.

Introduction:

The unlimited aim of living organism is reproduction and hence maximum biochemicals are channelised to gonads as per the stage of reproduction. Some biochemicals are utilized for growth and some for respiration to produce energy for metabolic and vital activities. Excess of absorbed food materials are deposited in tissues which are utilized during scarcity of food or high demand of energy. It therefore reflects on the biochemical composition of different parts of organism. Many of the molluscs being the source of food to man are studied in respect to their seasonal biochemical changes.

Among various classes of molluscs the nature of reserve food material is variable. One can therefore classify molluscs depending on the type of stored material. Lamellibranches may be considered to be polysaccharide oriented (Martin and Goddard, 1966) and amphineurons lipid oriented (Giese, 1966) while cephalopods do not preferentially accumulate nutrients (Chaige, 1933; Giese, 1959).

Mudkhede (1974) studied seasonal changes in whole body of *Corbicula reticularis*. Jadhav and Lomte (1982) and Mule (1988) made extensive work on seasonal variations in biochemical composition of different organs of *Lamellidens corrianus*. Bayne and Thompson (1970) determined biochemical composition of mantle, gonad (germinal) and non mental (somatic) tissues of *Mytilus edulis* where mantle serve as a storage site of nutrients as well as for gamete production. Wenne and Styczynska (1987) studied biochemical composition of *Macoma balthica* while Polak et al (1987) made seasonal estimation of lipids in it.

Materials and Methods:

Experimental animals *Lamellidens corrianus* were brought from different localities as per their availability to the laboratory during the first week of each month. *L. corrianus* animals were screened for sex composition. Males, females and the hermaphrodites from each locality and habitat were separated. After separation of bivalves, gonads and whole body of each sex of each species were separated and dried at 80 °C in the oven. Barnes and Blackstock's method (1973) was used by extracting the lipids in Methanol: Chloroform to estimate the total lipid contents from the dry powders of gonads and whole soft body. The data prepared is given in the table.

Table: Monthly variations lipid content in gonads and whole soft body of *L. corrianus* with reference to their habitat and sex.

Sr. No.	Month	Habitat	Sex	<i>Lamellidens corrianus</i>	
				Gonad %	Whole Soft Body %
1	November	Lentic	Male	19.78	15.23
			Female	16.15	18.23
			Hermaphrodite	17.16	16.25

		Lotic	Male	21.32	12.26
			Female	20.63	14.56
			Hermaphrodite	27.08	12.36
2	December	Lentic	Male	20.74	13.69
			Female	18.16	15.36
			Hermaphrodite	14.16	15.46
		Lotic	Male	10.03	11.36
			Female	20.61	10.23
			Hermaphrodite	22.08	9.891
3	January	Lentic	Male	18.74	15.69
			Female	15.65	15.36
			Hermaphrodite	12.16	12.46
		Lotic	Male	18.15	11.26
			Female	21.51	12.36
			Hermaphrodite	19.93	11.39
4	February	Lentic	Male	16.74	16.59
			Female	16.65	14.25
			Hermaphrodite	11.15	18.93
		Lotic	Male	19.74	14.56
			Female	22.16	18.96
			Hermaphrodite	22.39	16.59
5	March	Lentic	Male	21.22	15.46
			Female	17.26	17.98
			Hermaphrodite	18.39	16.45
		Lotic	Male	14.12	14.89
			Female	15.89	17.56
			Hermaphrodite	13.24	13.65
6	April	Lentic	Male	19.57	16.69
			Female	22.16	18.68
			Hermaphrodite	20.36	15.45
		Lotic	Male	15.26	18.69
			Female	21.69	16.56
			Hermaphrodite	16.58	14.65
7	May	Lentic	Male	21.41	19.56
			Female	24.36	17.58
			Hermaphrodite	22.86	16.45
		Lotic	Male	21.19	12.36
			Female	22.96	11.98
			Hermaphrodite	17.66	13.25
8	June	Lentic	Male	21.57	17.89
			Female	24.36	16.58
			Hermaphrodite	21.25	17.46
		Lotic	Male	42.39	13.24
			Female	19.44	19.85
			Hermaphrodite	20.33	18.75
9	July	Lentic	Male	21.83	17.25
			Female	18.93	19.45
			Hermaphrodite	19.58	18.75
		Lotic	Male	21.23	12.36
			Female	15.33	15.24
			Hermaphrodite	14.61	16.45
10	August	Lentic	Male	17.68	18.26
			Female	21.23	21.24
			Hermaphrodite	19.46	19.45

		Lotic	Male	20.86	18.12
			Female	19.44	18.45
			Hermaphrodite	15.32	14.16
11	September	Lentic	Male	17.81	19.45
			Female	22.99	14.87
			Hermaphrodite	18.76	16.87
		Lotic	Male	21.64	18.12
			Female	19.56	18.45
			Hermaphrodite	15.36	14.16
12	October	Lentic	Male	19.31	14.56
			Female	18.36	15.46
			Hermaphrodite	18.23	17.87
		Lotic	Male	19.65	16.12
			Female	17.61	17.45
			Hermaphrodite	21.56	14.16

Results and Discussion:

Monthly changes in lipids content in dry powders of gonad and whole body of *Lamellidens corrianus* as estimated from November to October are listed in table. In *Lamellidens corrianus* average percentage of lipids in the dry powder showed maximum lipids in gonad (27.08 %) as well as minimum in gonad (10.03 %) depending on the maturation stage of gonad while in whole body maximum lipids were (19.85%) and minimum lipid (9.89 %).

Piretti *et al.*, (1987) made investigation on seasonal variations of sterols and fatty acids in *Venus gallina* and *Scapharce inequivalvis* (Bruguere). Total lipid contents of *Crassostrea gigas*, *Mytilus edulis*, *Ruditapes philippinarum* and *Cerostoderma edule* were estimated by Deslous-Paoli *et al.*, (1988) and of *Macoma balthica* by Wenne and Styczynska (1987) and Polak *et al.*, (1987). Toshima *et al.*, (1988) studied anatomical distribution of sterols and fatty acids in the bivalve, *Macra chinensis*. A review of lipids in marine invertebrates including bivalves was given by Giese (1966) and Voogt (1983).

Nagabhushanam and Lomte (1972) in *Parreysia corrugate* and Jadhav and Lomte (1982) in *Lamellidens corrianus* found accumulation of fat in developing gonads. Similarly, in *Meretrix meretrix* (Nagabhushanam and Deshamukh, 1974) fat accumulates in developing gonads and reduces during spawning. The seasonal changes in lipid content of *Mytilus edulis*, the lipid level is generally higher in females than the males due to its accumulation in eggs (Lubet and Longcamp, 1969). In the Mediterranean waters, *Mytilus edulis* spawns repeatedly during the spring and early summer, and between each successive period the gonad is reconstituted. The lipid levels fall rapidly after spawning and then increase again as the gametes mature. In the model of summer during non reproductive period, the level of triglycerides and phospholipids remain low (Lubet and Longcamp, 1969), where as during winter higher fat levels occur due to increased lipid reserves in the developing eggs.

Nagabhushanam and Mane (1975) in *Katelysia opima* reported that lipid level of the whole body showed correlation with maturation and spawning of the mussels, increasing to peak level in mature mussels and decreased during spawning. Foot and mantle have low lipid level in *Parreysia corrugata* (Nagabhushanam and Lomte, 1972), high in gonad, highest in gravid and decreased after spawning. Giese *et al.*, (1967) observed relatively stable fat content for most of the year in *Tivela* except the small in gonad where lipid reaches the peak value of mature condition. John (1980) in *Anadare rhombea* found 32.1% to 16.4% lipid in hepatopancreas, 29.8% to 21% lipids in gonad while 20.5% to 17.4% lipids in foot. Nagabhushanam and Deshamukh (1974) in *Meretrix meretrix* found maximum in digestive gland (9.29%), Moderate in foot, gonads and rest of the body (2.0% to 3.5%) while very less in mantle (1.97%) and adductor muscles (1.42%) Jadhav and Lomte (1982) in *Lamellidens corrianus* observed high fat level in gonad (4.61% to 6.74%), Low in mantle (2.23% to 3.62%) and moderate in mid gut gland (3.73% to 5.62%), foot (2.26 to 4.17%), adductor muscles (2.27% to 3.64%) and gill (2.29% to 3.86%).

References:

1. Barnes, H. and Blackstok, J. (1973): Estimation of lipids in marine animals and tissues: detailed investigation of the sulpho-phosphovanillin method for total lipids. *J. Expt. Mar. Biol. Ecol.* 12(1):103-118.

2. Bayne B. L. and Thompson R. J. (1970): Some physiological consequences of keeping *Mytilus edulis* in the laboratory. *Hegol. Wiss. Meeresunters*, 20: 526-552.
3. Chaige, M. (1933): Sur la repartition du glycogene dans les organes de la seiche. *C.R. Soc. Biol. Paris*, 114: 1103-1105.
4. Deslous-Paoli, J.M., Heral, M., Jousset, M. (1988). Total lipid content and lipid energetic values of bivalve molluscs. *Comp. Biochem. Physiol. B. com. Biochem.* 89 (1):51-54.
5. Giese, A.C. (1959): Comparative Physiology: annual reproductive cycles of marine invertebrates. *An. Rev. Physiol.* 21:547-576.
6. Giese, A.C. (1966): Lipids in the economy of marine invertebrates. *Physiol. Rev.*, 46:244-298.
7. Giese, A.C. and Hart M.A. (1967): Seasonal changes in component indices and chemical composition in *Katherina tunicate*. *J. Exp. Mar. Biol. Ecol.*, 1:34-46.
8. Jadhav, M. L. and Lomte V. S. (1982): Seasonal variation in biochemical composition of the freshwater bivalve, *Lamellidens corrianus*. *Riv. Idrobiol*, 21: 1-3.
9. John, G. (1980): Studies on *Andara rhombea* (Born) (Mollusca: Bivalvia: Arcidae) from Porto Nova Coastal water. *Ph. D. Thesis Annamalai university Annamalainagar*.
10. Lubet, P. and Le Feron de Longcamp, D. (1969): Etude des variations annuelles des constituents lipidiques chez *Mytilus edulis* (L) de la Baie de seine (Calvados). *Comp. Ren. Sean. Soc. Biol.* 163: 1110-1112.
11. Martin, A. and Goddard, C. (1966): Carbohydrate metabolism in: Physiology of Mollusca" (Eds. Wilbur, K. and Younge, C) *Academic Press, New York, Vol. 2: 275-308*.
12. Mudkhede, L. M. (1974): Some biological aspects of the clam *Corbicula regularis*. *Ph. D. Thesis, Marathwada University, Aurangabad*.
13. Mule S. D. (1988): Reproductive physiology of *Lamellibranch* Molluscs from Maharashtra state. *Ph. D. Thesis, Marathwada University, Aurangabad*.
14. Nagabhushanam, R. and Lomte V. S. (1972): Biochemical composition of the different body components of the fresh water Mussel, *Parreysia corrugata*. *Marath. Univ. J. Sci.*, 11:299-303.
15. Nagabhushanam, R. and Deshmukh R. S. (1974): Seasonal changes in body component indices and chemical composition in the esturian clam, *Meretix meretix*. *Indian J. Fish.*, 21:531-542.
16. Nagabhushanam, R. and Mane U. H. (1975): Seasonal variation in the biochemical composition of the clam, *Kateysia opima*. *Rev. Bio.*, 67: 279-301.
17. Piretti, M.V., Taioli, F. and Pagliuca, G. (1987): Investigation of the seasonal variation of sterol and fatty acids constituents in the bivalve mollusc *Venus gallina* and *Scapharca inequalvis*. (Bruguere). *Comp. Biochem. Physiol. B. com. Biochem.* 88(4): 1201-1208.
18. Polak, Lucyna, Andrezej Jarzebski, Roman Wenne and Leonard Falkowski (1987): Seasonal changes in conditions and lipid composition of the bivalve *Macoma balthica* (L) from the gulf of Gdansk (Southern Baltica) (Poland). *Comp. Biochem. Physiol. B. com. Biochem.* 88(3): 881-886.
19. Toshima, Shin-Ichi, Akio Kenazawa and Ryuji Shimamoto (1988): Anatomical distribution of steroids and fatty acids in the bivalve, *Macra chinensis*. *Bull. Jpn. Soc. Sci. Fish.* 54(2): 293-298.
20. Voogt, P. A. (1983): Lipids: Their distribution and metabolism in: the Mollusca (Ed. Hochachka, P.W.), *Academic Press, New York and London, Vol. 1, 329-370*.
21. Wenne R. and Styczynska-Jurewicz, E. (1987): Gross biochemical composition of the bivalve, *Macoma balthica* from the gulf of Gdansk (Southern Baltica) *Mar. Biol.* (Berl) 96(1): 73-78.