MARINE FAUNAL DIVERSITY IN INDIA

Taxonomy, Ecology and Conservation

Edited by
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Chapter 13

Fish and Shellfish Fauna of Chilika Lagoon: An Updated Checklist

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INTRODUCTION

Chilika lagoon is the largest coastal wetland in India and an internationally recognized Ramsar Site. It is regarded as a rich storehouse of living aquatic resources. With unique ecological characteristics resulting from two antagonistic hydrological processes—fresh water inflow and sea water influx—Chilika has no parallel in the tropical world. Chilika lagoon, lying on the east coast of India, is situated between 19o 28′ to 19o 54′ N latitude and 85o 05′ to 85o 38′ E longitude; it fluctuates in area from a monsoon maximum of 1165 km2 to a dry season minimum of 906 km2 (annual average 923 km2); its linear axis is 64.3 km in length, and it has an average mean width of 20.1 km (Pattnaik, 2002; Ghosh and Pattnaik, 2005; Ghosh *et al*., 2006). The lagoon is separated from the Bay of Bengal by a sand bar whose width varies from 100 m to 1.5 km; a 30 km outer (inlet) channel connects the main lagoon with the Bay of Bengal. The 14 km long Palur canal connects the southern end of the lagoon to the sea through Rushikulya river mouth. The lagoon was critically threatened during the last few decades because of natural changes coupled with anthropogenic pressure. In the process of degradation of the ecosystem, the lagoon fishery became the major victim, causing misery to fishing communities. Hence, it was imperative to restore the fragile ecosystem of Chilika lagoon to recover *inter alia* the fisheries and biodiversity for the greater benefit of the wetland communities. After the opening of a new artificial lagoon mouth for restoration of the lagoon by Chilika Development Authority (CDA), the fishery production has increased many fold. The lagoon had witnessed multidimensional problems: increased sediment load, decreased salinity, Ghery prawn culture (Pens), excessive fishing pressure, invasive weed growth and several other natural changes coupled with incessant anthropogenic pressure/activities, which together altered the natural attributes of the lagoon.

The lagoon, being of estuarine character, is shallow throughout. The major part of the lagoon (the northern sector) has a depth of less than 0.3 m, while the maximum of 4.2 m was seen in the central sector during the pre-restoration period. The Magarmukh, being very shallow (20–30 cm deep) pre-intervention, could not be navigated even by flat-bottomed country boats.

Numerous islands are present in the lagoon, especially near the channel. Best known among them is Nalaban, a low, flat marshy island of 15.53 km2, covered with low vegetation. Nalaban Island was designated as a Sanctuary in 1987 in consideration of its unique features as a habitat for avifauna. The Nalaban Bird Sanctuary is the only protected part of the Chilika lagoon. Several rocky islands in the southern sector, such as Kalijai, Somolo, Dumkudi, Honeymoon, Breakfast and Bird Island, represent the inundated remains of the Eastern Ghats (Bandyopadhyay and Gopal, 1991). Along the channel and

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between the channel and the lagoon proper are many islands made up of entrenched sand dunes, known collectively as Garh Krushnaprasad Block. These islands cover an area of about 34.4 km2 (Bandyopadhyay and Gopal, 1991).

Hydrologically, Chilika lagoon is influenced by three subsystems: the Mahanadi distributaries (Delta Rivers), 52 rivulets and streams draining into the lagoon from the western catchment, and the sea (Bay of Bengal). The lagoon is situated at the southern margin of the Mahanadi delta; it receives less than 6 percent of the total Mahanadi flow, but this volume is close to half the total fresh water inflow into the lagoon. The lagoon receives inflows from its western catchments (1560 km2), and runoff and irrigation drainage from the delta region (2250 km2). The total Chilika drainage basin, including the lagoon itself, the contributing islands and coastal strip has an area of 4300 km2 (World Bank, 2005). The Chilika drainage basin is estimated to contribute about 1760 million cubic metres (mcm) of water into the lagoon, while direct precipitation has been estimated at about 870 mcm, and total evaporation losses are estimated at about 1286 mcm (ORSAC, 1988). The freshwater inflows influence the biogeochemistry of Chilika lagoon in several ways, although few of these are well quantified. Firstly, and most importantly it is the freshwater inflows that drive the spatial and temporal salinity dynamics, that contribute to the temporal and spatial mosaic of different aquatic habitats for plants and animal species, and their varying lifecycle requirements (World Bank, 2005). It is primarily this dynamic salinity regime that enables the lagoon to support high biodiversity and productive fishery.

Ecologically, Chilika lagoon is an assemblage of shallow to very shallow marine, brackish and freshwater ecosystems. Salinity is the dominant factor determining the lagoon‘s ecology, and salinity dynamics are controlled jointly by the nature of the connection to the sea, associated tidal fluctuation, and the volume and timing of freshwater inflows to the lagoon from the Delta Rivers and western catchments (Mohapatra *et al.*, 2007a). Both of these controllingfactors are subjected to natural variability, and have been affected by anthropogenic pressure. The lagoon is broadly divided into four ecological sectors based on differences in ecological features. These sectors are called northern, central, southern, and outer channel sectors. Magarmukh is the gateway between the main lagoon and the outer channel (Mohapatra *et al.*, 2007a). The lagoon undergoes a cyclical variation in salinity throughout the year, with different patterns seen in different ecological sectors. It is the periodicity in salinity that allows freshwater as well as marine and estuarine species to thrive in the lagoon. No mangrove vegetation is found in the lagoon except for two species (few in number confined to only one rocky island in southern sector): *Cassipourea ceylanica* (rare and endemic to Chilika) belonging to the Rhizophoraceae family, which is only reported from Chilika lagoon (Panda and Patnaik, 2002), and *Aegiceras corniculatum* of the Myrsinaceae family. This small patch of mangrove vegetation has no relevance to the mud crab habitat in the lagoon. The sea grass beds, which were almost lost during the eco-degradation phase, reappeared after the opening of the new lagoon mouth and have covered extensive areas in the central, southern and outer channel sectors. An extensive area in the northwest part of the lagoon is dominated by *Phragmites karka*.

The physical configuration and limnology of the lagoon is greatly influenced by different oceanographic processes, mainly wave action, littoral drift and tidal influence. Along Chilika coast, maximum wave height (3–4 m) occurs during the southwest monsoon period. The wave period of that season ranges from 6 to 14 s, whereas it varies in the range 6–18 s during the northeast monsoon. The Bay of Bengal in general experiences two surface currents: a clockwise northerly current during January to April/May and an anticlockwise southerly current from October to December (La Fond, 1958). This in

turn affects the lagoon–seawater exchange and shoal formation along the mouth region. High salinity, greater transparency and low temperature prevail during the clockwise circulation of the summer season, whereas during the anticlockwise circulation the water mass is characterized by low salinity, less transparency and high nutrients and temperature (Ganapati and Ramasarma, 1958).

Shrinkage of the old mouth has been attributed primarily to the littoral drift. It has been estimated that one million tonnes of sediment move in a northeastern direction every year during March to October, and such net transport is believed to be responsible for shrinkage of the old mouth. The tide of this region is a mixed semi-diurnal type. The semidiurnal tidal fluctuations control the ingress of seawater into the lagoon. Tidal range near Chilika old mouth has been estimated at 85 cm (Rajan, 1971).

The unique and fragile ecosystem of Chilika lagoon, with its estuarine character and rich fishery resources, gradually lost its ecological characteristics as a result of changing coastal processes, a degraded drainage basin and anthropogenic pressure over the last few decades. Being a coastal wetland, the lagoon is quite sensitive to changes in hydrological regimes. During the last few decades, the lagoon gradually moved towards freshwater systems because of significant decrease in salinity. Several natural changes were the major factors contributing to the rapid deterioration of the lagoon ecosystem: shifting of the lagoon mouth by more than 30 km from the lagoon proper, rapid siltation at the rate of 7.53 × 105 m3 annually (World Bank, 2005), explosive spread of invasive weeds, shoal formations in the inlet channel, choking of the Magarmukh and Palur canals, etc. (Pattnaik, 2000, 2001; Mohanty and Behera, 2002; Nayak *et al.*, 2002). The cross section of the outer channel was significantly reduced by shoal formation along the channel, which resulted in considerable hydraulic head loss and flushing action. Various studies on the coastal process indicated that about one mcm of littoral drift prevails in this region of the coast, which led to shifting of the mouth in the northeastern direction (Chandramohan *et al.*, 2002). On average, the shifting was about 350 m per annum. The depth of the water at Magarmukh, which is considered as the gateway between the main lagoon and outer channel, was observed to be alarmingly low, at only about 30 cm in December 1997. This was identified as the most critical zone preventing the discharge of freshwater sediment during monsoon to the sea through the outer channel and the ingress of saline water to the lagoon during post-monsoon months. These natural changes distinctively contributed to the eco-degradation in the lagoon, which was further aggravated by incessant anthropogenic activities such as carving out extensive fringe areas with earthen dikes for agriculture, prawn culture pond development along fringe areas, unabated expansion of economical and illegal shrimp pen culture (Prawn gheries) inside the lagoon covering more than 10,000 ha (11% of the lagoon area) (Mohanty *et al.*, 2004a,b), and excessive fishing activity including destructive fishing.

Analysis of satellite data revealed that during the years 1973, 1977, 1985 and 1993 the weed-covered areas in the lake were 20, 60, 200 and 398 km^2, respectively, as reported by Ghosh (2002). The northern sector exhibited dominance of freshwater weeds. Annual invasion of weeds by 1998 was calculated to be 15 km^2.

The lagoon is one of the hotspots of biodiversity and shelters a number of endangered or threatened species listed in the IUCN Red List of threatened species. The lagoon has profound socio-economic significance, since its rich fishery resources support the livelihood and nutritional security of about 0.2 million fisherfolk living in and around the lagoon. The fishery resources of the lagoon suffered

serious setback from the later part of the 1980s when the salinity level sharply decreased and recruitment routes (outer channel and Palur canal) gradually became silted up, adversely affecting the recruitment of fish and shellfish seed from the sea into the lagoon. Jhingran (1963) estimated that 63–75 percent of the annual fish production was contributed by migratory species. Annual fish landing, on an average, was 7200 tons during the 1980s but decreased to 1737 tons during 1999–2000, a decrease of about 76 percent. Significant loss of overall biodiversity of the lagoon took place during this period (Ghosh, 2002).

In the aftermath of the gradual closure of the old mouth and Palur canal, the lagoon had turned more towards a freshwater ecosystem, resulting in substantial changes in species composition with significant increase in freshwater forms. The Zoological Survey of India (ZSI) after completing the Chilika Expedition (1985–87) opined that the lake ecosystem was tending towards a freshwater ecosystem and warranted urgent restoration measures. Owing to the degraded state of the lagoon‘s ecosystem with drastic changes in the ecological characteristics and overall loss of biodiversity, the Chilika lagoon was included in the Montreux Record (Threatened list of Ramsar Sites) in 1993.

From the 1950s to 2000 the lagoon was in continual decline, with increasing sediment loads and decreasing salinity. The fishery showed a major decline, invasive weeds began to take hold, and the entire lagoon progressively shrunk in area and volume (World Bank, 2005). The eco-degradation reached a critical stage with loss of ecological characteristics, change in ecosystem function and overall loss of biodiversity which brought miseries to about 0.2 million local people directly and indirectly depending on the lagoon‘s resources (goods) and services. Being a *bona fide* signatory to the Ramsar Convention, and since Chilika is listed as a Ramsar Site, the Government of India took urgent measures to restore Chilika lagoon through the State Government and provided the necessary funds from the Tenth and Eleventh Finance Commission Grants. The State Government constituted an Authority called Chilika Development Authority (CDA) which implemented the eco-restoration programme in Chilika lagoon during 2000–01 and 2001–02 following an ecosystem approach. The restoration programme included four major activity components:

1. Hydrological intervention
2. Palur canal renovation
3. Catchments treatment
4. Operation of the Naraj Barrage for preferential environmental flow.

Hydrology is the most important factor for the maintenance of a wetland‘s structure and function. Hydrologic conditions affect many vital biotic and abiotic factors including the salinity regime of coastal wetlands. Chilika lagoon is a highly productive coastal wetland. The lagoon was in a degraded state and tending towards a freshwater ecosystem due to siltation and choking of the mouth (inlet) resulting in the poor exchange of water. This had resulted in decline in productivity and loss of biodiversity. Against this backdrop the CDA initiated an integrated adaptive management process to address the complex ecological and socio-economic issues of the Chilika lagoon with an ecosystem approach. There was an assessment of the principal causes of degradation, with the objective to implement appropriate and effective methods to restore the lagoon to its former state through targeted scientific studies and wide stakeholders‘ consultations. Intensive studies of the coastal processes showed that the tidal influx into the lagoon was adversely affected by the shoal formation along the lead channel and continuous shifting of

the mouth as a result of littoral drift. This also adversely affected the auto-recruitment and breeding migration of fish species through the mouth opening into the sea. The services of the Central Water and Power Research Station (CWPRS, Pune) were commissioned for the creation of a two dimensional numerical model to establish the optimum salinity gradient. From the findings of the two-dimensional model studies, the CWPRS recommended a ‗straight cut' to improve the salinity gradient of the lagoon to the desired level. Accordingly, a new mouth was opened on September 2000 at a distance of 11 km from Magarmukh. To improve the circulation and the exchange of water, a lead channel of 3.2 km was dredged at Magarmukh, which formed the link between the lagoon and the outer channel, connecting to the sea. Environment Impact Assessment (EIA) was carried out by the National Institute of Oceanography (NIO), Goa, to assess the impact of the hydrological intervention. The lead channel at Magarmukh was extended towards the river outfall point over a length of 22.6 km for better propagation of salinity and flushing out of sediment from this sector. The dredged channel also facilitates the dispersal of fish and shellfish juveniles to this sector. After this intervention, there has been a significant improvement of the lagoon ecosystem, as is evident from the enhancement of fishery resources, improvement of the tidal and salinity flux into the lagoon, flushing out of sediment, the decrease of freshwater invasive species, increase in the Irrawaddy dolphin population, expansion of the sea grass meadows and decreased water logging.

The hydrological intervention not only rejuvenated the ecosystem of the lagoon but also immensely benefited the community depending on the lagoon, whose average annual income increased due to enhancement of the fishery resources. There have been significant improvements of the salinity gradient after the opening of the mouth. Before the opening, the salinity level of the northern sector of the lagoon was almost zero throughout the year. There was an abrupt change in salinity level of the central sector and outer channel sector at the onset of monsoon. After the opening of the new mouth, less fluctuation of the salinity level was observed. The gradual reduction in the salinity from the lagoon mouth to the lagoon interior after the opening of the mouth is providing the desirable sense of direction for the euryhaline forms to enter into the lagoon from the sea. This facilitates the auto-recruitment of fish, prawn and crab into the lagoon. After the hydrological intervention, the average fish landing increased by many fold (Mohapatra *et al.*, 2007a; Mohanty *et al.*, 2009).

Palur canal (14 km) connects the Palur Bay of Chilika lagoon in the southern sector to the Rushikulya estuary. Because of heavy siltation in the canal the exchange of water between the sea and the southern sector of the lagoon was not taking place. Palur canal plays a vital role in maintaining the salinity gradient and the auto-recruitment of economic species from the sea to enrich the fishery resources of the southern sector. The canal was renovated by CDA with an objective to enhance the fishery resources of the southern sector. It became functional from the year 2004. This renovated canal is providing an effective recruitment and migration route for fish and shellfish to the southern sector. After renovation of the Palur canal, there has been a significant improvement of the fishery resources of this sector.

Although hydrological intervention was a key to the restoration of Chilika lagoon, some other ameliorative measures outside the lagoon, particularly the vast catchments (2250 km2) under Mahanadi river basin and 1560 km2 western catchments are also important. More than 48 catchment streams drain freshwater into the lagoon during rains, with an estimated sediment load of 1.06 million tons to the lagoon per year. The hilly areas in the western catchment were once thickly forested, but were mostly deforested

by the local communities. This caused increased silt/sediment loading in the lagoon. Hence, with a view to arresting silt loading in the lagoon and preventing rapid soil erosion, a planned plantation programme through participatory micro-watershed implementation was taken up in the degraded catchments. The micro-watershed projects with community participation were undertaken on a priority basis to demonstrate regeneration of the highly degraded catchment ecosystem and sharing of benefits of water and land resources. The programme was initiated in 2001–02 with a very successful implementation of the ‗Dengei Pahada' participatory micro watershed project in the central part of the western catchment.

Coastal wetlands like Chilika are especially sensitive to the hydrologic regime, as this controls the depth variations and influences the water quality conditions that determine the range and character of aquatic habitats. Salinity is the most dominant factor determining the lagoon's ecology, and the salinity dynamics are controlled jointly by two factors:

- the nature of the connection to the sea, associated tidal fluctuations; and
- the volume and timing of freshwater inflows to the lagoon from the delta (Mahanadi) distributaries and western catchments.

Both the controlling factors are subjected to natural variability and have been affected by anthropogenic activities. The freshwater inflows into the lagoon have long been affected by upstream water management for irrigation, drainage and flood mitigation.

The World Bank-assisted Orissa Water Resources Consolidation Project (OWRCP) considered the water management in Chilika lagoon very critically for sustainability of the lagoon's ecological function and bio-resources, particularly fisheries, avifauna and the dolphin population, since the major freshwater inflow into the lagoon is affected by Mahanadi distributaries. An operation schedule was formulated for flow control at the new Naraj Barrage on Mahanadi to allow preferred flow of freshwater into Chilika for maintenance of the lagoon's eco-function at its optimal condition.

DIVERSITY STATUS OF FINFISH AND SHELLFISH

Pre-intervention Period

During 1914–24 the Zoological Survey of India (ZSI) carried out pioneering work on faunal diversity and recorded 112 fish species, 24 prawn and 26 brachyuran crabs from Chilika lagoon (Kemp, 1915; Chaudhuri, 1916a–c;

TABLE 13.1 **Diversity Status (Number of Species) of Fish and Shellfish in Chilika Lagoon during Pre-restoration Phase**

Status parameter	**Pre-restoration survey (1914–2000)**
Species recorded by ZSI, CIFRI and individual workers	
Fish	225 (G/149, F/72, O/16)
Shrimp & prawn	24 (G/13,F/9,SO/2)
Lobster	Not recorded
Crab	28 (G/22, F/9, SO/1)
Inventory of recorded species—last survey by ZSI (1985–87)	

Fish	71 (G/60, F/14, O/13)
Shrimp & prawn	13 (G/6, F/5, SO/2)
Lobster	Not recorded
Crab	11 (G/11, F/9, SO/1)

G, Genus; F, Family; O, Order; SO, Suborder; ZSI, Zoological Survey of India; CIFRI, Central Inland Fisheries Research Institute; CDA, Chilika Development Authority.

Hora, 1923). The Central Inland Fisheries Research Institute (CIFRI), while investigating the fisheries of Chilika lagoon, recorded 55 additional fish species during 1957–65, and some individual workers during 1954–86 added a further collection of 46 fish species (Kaumans, 1941; Jones and Sujansinghani, 1954; Menon, 1961; Misra, 1969, 1976a,b; Jhingran and Natrajan, 1966, 1969; Rajan *et al.*, 1968; Mohanty, 1973; Talwar and Jhingran, 1991). During the Chilika expedition (1985–87), the ZSI recorded another 4 species of fish and 2 species of crab. Thus by 1987, 217 fish species (Rama Rao, 1995), 28 crab species (Maya Deb, 1995) and 24 prawn species (Reddy, 1995) were listed. Later, Bhatta *et al.* (2001) added 8 new records of fish, bringing the total to 225 species of fishes, 24 species of prawns and 28 crab species before opening of the new mouth under hydrological intervention in September 2000. During the eco-degradation phase in the 1990s when the ecological characteristics were changed, there may have been loss of faunal diversity to a certain extent. Status of fish and shellfish biodiversity in Chilika lagoon during the pre-restoration period is given in Table 13.1.

Post-intervention Period

During the post-restoration phase (2000–01 to 2003–04), CDA made inventory in Chilika lagoon of fish, prawn and crab fauna since 2000–01. A total of 221 species have been collected from the lagoon up to March 2004, comprising 187 species of fish, 18 species of prawn, 14 species of crab and 2 species of lobster (Mohanty *et al.*, 2006; Mohapatra *et al.*, 2007a). The faunal inventory included 56 new records (43 species of fish, 4 prawns, 7 crabs and 2 lobsters) during the period. From the post-restoration records, 69.78 percent fish, 64.28 percent prawn and 40 percent crab species were recovered, and the overall recovery was 66.36 percent up to March 2004. Freshwater elements in the catches have decreased significantly by 45.3 percent during the post-restoration period as compared with the pre-restoration period. Species richness in the Outer Channel sector considerably increased after opening of the new mouth. Some further fish species were added by Wetlands International-South Asia (2011), and the total list of fish comprised 314 species from the pre-restoration to the post-restoration period. During the recent survey carried out by the Marine Aquarium and Regional Centre, Zoological Survey of India (MARC, ZSI) on the ―Ornamental Fauna of East coast of India,‖ one species of fish was collected and identified as *Acanthurus triostegus* (Linnaeus, 1758), Registration No. MARC/ZSI/F2516, which was not reported to date from Chilika lagoon; this brings the total of ichthyofauna to 315 species. A detail account of brachyuran crab fauna of Chilika lagoon from the pre-restoration to post-restoration period has been given by Mohapatra *et al.*, 2007b in which the total crab fauna reported from Chilika was 35 species. Thereafter, one species *Charybdis feriata*, was wrongly reported as a new record to Chilika lagoon by Sahoo *et al.*, 2008. The same species was reported from Chilika lagoon as *Charybdis cruciata* (Mohapatra *et al.*, 2007b), which is synonymous to *Charybdis feriata*; thus, in total, 35 species of crabs were reported from the Chilika lagoon to date. A detailed checklist of the finfish and shellfish of the lagoon is given in Table 13.2.

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

Sl. No.	Family	Species
Finfish		
1.	**Hemiscylliidae** (Bamboo sharks)	*Chiloscyllium indicum* (Gmelin, 1789)**
2.	**Carcharhininidae** (Requiem sharks)	*Carcharhinus leucas* (Müller & Henle, 1839)**
3.		*Carcharhinus limbatus* (Müller & Henle, 1839)
4.		*Carcharhinus melanopterus* (Quoy & Gaimard, 1824)
5.		*Glyphis gangeticus* (Müller & Henle, 1839)
6.		*Scoliodon laticaudus* (Müller & Henle, 1838)*
7.	**Sphyrnidae** (Hammerheaded shark)	*Eusphyra blochii* (Cuvier, 1816)** [Previously recorded as *Sphyrna blochii* (Cuvier, 1817)]
8.		*Sphyrna lewini* (Griffith & Smith, 1834)**
9.	**Pristidae** (Sawfish)	*Pristis clavata* (Garman, 1906) [Previously recorded as *Pristis pectinata* (Latham, 1794)]
	Rhinobatidae (Guitar fishes)	
10.		*Rhynchobatus djiddensis* (Forsskål, 1776)**
11.	**Dasyatidae** (Stingrays)	*Himantura imbricata* (Bloch & Schneider, 1801)
12.		*Himantura marginata* (Blyth, 1860)** [Previously recorded as *Dasyatis marginatus* (Blyth, 1860)]
13.		*Himantura uarnak* (Forsskål, 1775)*
14		*Himantura walga* (Müller & Henle, 1841)*
15.		*Pastinachus sephen* (Forsskål, 1775)* [Previously recorded as *Hypolophus sephen* (Forsskål, 1775)]
16.	**Myliobatidae** (Eaglerays)	*Aetobatus flagellum* (Bloch & Schneider, 1801)*
17.		*Aetobatus narinari* (Euphrasen, 1790)*
18.		*Aetomylaeus nichofii* (Bloch & Schneider, 1801)*
19.	**Notopteridae** (Featherbacks)	*Chitala chitala* (Hamilton, 1822)* [Previously recorded as *Notopterus chitala* (Hamilton, 1822)]
20.		*Notopterus notopterus* (Pallas, 1769)*
21.	**Elopidae** (Tenpounders)	*Elops machnata* (Forsskål, 1775)*
22.	**Megalopidae** (Tarpons)	*Megalops cyprinoides* (Broussonet, 1782)*
23.	**Anguillidae** (Freshwater eels)	*Anguilla bengalensis bengalensis* (Gray, 1831)*
24.		*Anguilla bicolor bicolor* (McClelland, 1844)*
25.	**Muraenidae** (Moray eels)	*Strophidon sathete* (Hamilton, 1822)* [Previously recorded as *Thyrosoidea macrura* (Blecker, 1854)]
26.	**Ophichthidae** (Snake eels)	*Lamnostoma orientalis* (McClelland, 1844)
27.		*Pisodonophis boro* (Hamilton, 1822)*
28.		*Pisodonophis cancrivorus* (Richardson, 1848)
29.	**Muraenesocidae** (Pike congers)	*Congresox talabonoides* (Bleeker, 1853)*
30.		*Muraenesox bagio* (Hamilton,1822)**
31.		*Muraenesox cinereus* (Forsskål, 1775)*
32.	**Clupeidae** (Herrings, shads, sprats, sardines, pilchards)	*Amblygaster leiogaster* (Valenciennes, 1847)**
33.		*Amblygaster sirm* (Walbaum, 1792) [Previously recorded as *Sardinella sirm* (Walbaum,1792)]
34.		*Anodontostoma chacunda* (Hamilton, 1822)*
35.		*Corica soborna* (Hamilton, 1822)*
36.		*Dussumieria acuta* (Valenciennes, 1847)
37.		*Dussumieria elopsoides* (Bleeker, 1849)**

(Continued)

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

38.		*Ehirava fluviatilis* (Deraniyagala, 1929)**
39.		*Escualosa thoracata* (Valenciennes, 1847)*
40.		*Gonialosa manmina* (Hamilton, 1822)*
41.		*Gudusia chapra* (Hamilton, 1822)*
42.		*Hilsa kelee* (Cuvier, 1829)*
43.		*Nematalosa nasus* (Bloch, 1795)*
44.		*Sardinella fimbriata* (Valenciennes, 1847)**
45.		*Sardinella longiceps* (Valenciennes, 1847)**
46.		*Sardinella melanura* (Cuvier, 1829)
47.		*Tenualosa ilisha* (Hamilton, 1822)* [Previously recorded as *Hilsa ilisha* (Hamilton, 1822)]
48.		*Tenualosa toli* (Valenciennes, 1847)**
49.	**Engraulidae** (Anchovies)	*Setipinna phasa* (Hamilton, 1822)
50.		*Stolephorus baganensis* (Hardenberg, 1933)*
51.		*Stolephorus commersonnii* (Lacepède, 1803)*
52.		*Stolephorus dubiosus* (Wongratana, 1883)*
53.		*Stolephorus indicus* (Van Hasselt, 1823)*
54.		*Thryssa gautamiensis* (Babu Rao, 1971)**
55.		*Thryssa hamiltonii* (Gray, 1835)*
56.		*Thryssa kammalensoides* (Wongratana, 1883) [Previously recorded as *Thryssa kammaleneis* (Bleeker, 1849)]
57.		*Thryssa malabarica* (Bloch, 1795)*
58.		*Thryssa mystax* (Bloch & Schneider, 1801)*
59.		*Thryssa polybranchialis* Wongratana, 1983*
60.		*Thryssa purava* (Hamilton, 1822)*
61.		*Thryssa setirostris* (Broussonet, 1782)**
62.		*Thryssa vitrirostris* (Gilchrist & Thompson, 1908)**
63.	**Chirocentridae** (Wolf herrings)	*Chirocentrus dorab* (Forsskål, 1775)
64.	**Pristigasteridae** (Pellonas)	*Ilisha elongata* (Bennett, 1830)**
65.		*Ilisha megaloptera* (Swainson, 1839)*
66.		*Ilisha melastoma* (Bloch & Schneider, 1801)
67.		*Opisthopterus tardoore* (Cuvier, 1829)**
68.	**Chanidae** (Milkfish)	*Chanos chanos* (Forsskål, 1775)*
69.	**Cyprinidae** (Carps & minnows)	*Amblypharyngodon mola* (Hamilton, 1822)*
70.		*Chela cachius* (Hamilton, 1822)*
71.		*Laubuca laubuca* (Hamilton, 1822)* [Previously recorded as *Chela laubuca* (Hamilton, 1822)]
72.		*Cirrhinus mrigala* (Hamilton, 1822)*
73.		*Cirrhinus reba* (Hamilton, 1822)*
74.		*Crossocheilus latius* (Hamilton, 1822)
75.		*Danio rerio* (Hamilton, 1822) [Previously recorded as *Brachydanio rerio* (Hamilton, 1822)]
76.		*Esomus danricus* (Hamilton, 1822)*
77.		*Catla catla* (Hamiltton, 1822)*
78.		*Labeo boga* (Hamilton, 1822)**
79.		*Labeo calbasu* (Hamilton, 1822)*
80.		*Labeo gonius* (Hamilton, 1822)**
81.		*Labeo rohita* (Hamilton, 1822)*
82.		*Osteobrama cotio peninsularis* (Silas, 1952)**
83.		*Osteobrama vigorsii* (Sykes, 1839)
84.		*Puntius chola* (Hamilton, 1822)*

(Continued)

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

85.		*Systomus sarana* (Hamilton, 1822)*
86.		*Puntius sophore* (Hamilton, 1822)*
87.		*Pethia ticto* (Hamilton, 1822)*
88.		*Puntius vittatus* (Day, 1865)
89.		*Rasbora daniconius* (Hamilton, 1822)* [Previously recorded as *Parluciosoma daniconius* (Hamilton, 1822)]
90.		*Rasbora rasbora* (Hamilton, 1822).*
91.		*Salmophasia bacaila* (Hamilton, 1822)*
92.	**Cobitidae** (Loaches)	*Lepidocephalichthys guntea* (Hamilton, 1822) [Previously recorded as *Lepidocephalus guntea* (Hamilton, 1822)]
93.	**Bagridae** (Bagrid catfishes)	*Mystus cavasius* (Hamilton, 1822)*
94.		*Mystus gulio* (Hamilton, 1822)*
95.		*Mystus vittatus* (Bloch, 1794)*
96.		*Sperata seenghala* (Sykes, 1839)* [Previously recorded as *Aorichthys seenghala* (Sykes, 1839)]
97.	**Siluridae** (Eurasian catfishes)	*Ompok bimaculatus* (Bloch, 1794)*
98.		*Ompok pabda* (Hamilton, 1822)*
99.		*Wallago attu* (Bloch & Schneider, 1801)*
100.	**Schilbeidae** (Schilbid catfishes)	*Ailia coila* (Hamilton, 1822)*
101.		*Eutropiichthys vacha* (Hamilton, 1822)
102.		*Silonia silondia* (Hamilton, 1822)
103.	**Pangasiidae** (Shark catfish)	*Pangasius pangasius* (Hamilton, 1822)*
104.	**Sisoridae** (Sisorid catfish)	*Bagarius bagarius* (Hamilton, 1822)*
105.		*Bagarius yarrelli* (Sykes, 1839)**
106.	**Clariidae** (Airbreathing catfish)	*Clarias magur* (Hamilton, 1822)* [Previously recorded as *Clarias batracacus* (Linnaeus, 1758)]
107.	**Heteropneustidae** (Airsac catfish)	*Heteropneustes fossilis* (Bloch, 1794)*
108.	**Ariidae** (Sea catfishes)	*Arius arius* (Hamilton, 1822)*
109.		*Arius maculatus* (Thunberg, 1792)
110.		*Nemapteryx caelata* (Valenciennes, 1840)* [Previously recorded as *Arius caelatus* Valenciennes, 1840]
111.		*Osteogeneiosus militaris* (Linnaeus, 1758)*
112.		*Plicofollis argyropleuron* (Valenciennes, 1840) [Previously recorded as *Arius satparanus* Chaudhuri, 1916]
113.		*Plicofollis tenuispinis* (Day, 1877)
114.	**Plotosidae** (Stinging catfishes)	*Plotosus canius* (Hamilton, 1822)*
115.		*Plotosus lineatus* (Thunberg, 1787)*
116.	**Synodontidae** (Lizardfishes)	*Saurida tumbil* (Bloch, 1795)**
117.		*Trachinocephalus myops* (Forster, 1801)**
118.	**Mugilidae** (Mullets)	*Liza macrolepis* (Smith, 1846)*
119.		*Liza melinoptera* (Valenciennes, 1836)*
120.		*Liza parsia* (Hamilton, 1822)*
121.		*Liza planiceps* (Valenciennes, 1836)* [Previously recorded as *Liza tade* (Forsskal, 1775)]
122.		*Liza subviridis* (Valenciennes, 1836)*
123.		*Liza vaigiensis* (Quoy & Gaimard, 1825)
124.		*Mugil cephalus* Linnaeus, 1758*
125.		*Rhinomugil corsula* (Hamilton, 1822)*
126.		*Valamugil cunnesius* (Valenciennes, 1836)*

(Continued)

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

127.		*Valamugil seheli* (Forsskål, 1775)
128.		*Valamugil speigleri* (Bleeker, 1858–59)*
129.	**Atherinidae** (Oldworld silversides)	*Atherinomorus duodecimalis* (Valenciennes, 1835)**
130.		*Atherinomorus lacunosus* (Forster, 1801)**
131.	**Belonidae** (Needlefishes)	*Strongylura leiura* (Bleeker, 1850)*
132.		*Strongylura strongylura* (Van Hasselt, 1823)*
133.		*Xenentodon cancila* (Hamilton, 1822)*
134.	**Hemiramphidae** (Halfbeaks)	*Hemiramphus far* (Forsskål, 1775)**
135.		*Hyporhamphus limbatus* (Valenciennes, 1847)*
136.	**Adrianichthyidae** (Adrianichthyids)	*Oryzias dancena* (Hamilon, 1822)*
137.	**Aplocheilidae** (Asian rivulines)	*Aplocheilus panchax* (Hamilton, 1822)*
138.	**Syngnathidae** (Pipefishes and Seahorses)	*Hippocampus fuscus* (Rüppell, 1838)* [Previously recorded as *Hippocampas brachyrhynchus* (Duncker, 1940)]
139.		*Ichthyocampus carce* (Hamilton, 1822)*
140.		*Hippichthys cyanospilos* (Bleeker, 1854)** [Previously recorded as *Syngnathus cyanospilos* (Bleeker, 1854)]
141.	**Synbranchidae** (Swamp eels)	*Ophisternon bengalense* McClelland, 1844**
142.	**Mastacembelidae** (Spiny eels)	*Macrognathus aral* (Bloch & Schneider, 1801)*
143.		*Macrognathus pancalus* (Hamilton, 1822)*
144.		*Mastacembelus armatus* (Lacepède, 1800)*
145.	**Scorpaenidae** (Scorpionfishes)	*Pterois radiata* (Cuvier, 1829)* [Previously recorded as *Pteropterus radiate* (Cuvier, 1829)]
146.	**Tetrarogidae** (Waspfishes)	*Tetraroge niger* (Cuvier, 1829)**
147.	**Platycephalidae** (Flatheads)	*Cociella crocodilus* (Cuvier, 1829)**
148.		*Kumococius rodericensis* (Cuvier, 1829)** [Previously recorded as *Suggrundus rodericensis* (Cuvier, 1829)]
149.		*Platycephalus indicus* (Linnaeus, 1758)*
150.	**Ambassidae** (Perchlets, glass fishes)	*Ambassis ambassis* (Lacepede, 1802)* [Previously recorded as *Ambassis commersoni* (Cuvier, 1828)]
151.		*Ambassis gymnocephalus* (Lacepède, 1802)*
152.		*Chanda nama* Hamilton, 1822*
153.		*Parambassis ranga* (Hamilton, 1822)* [Previously recorded as *Pseudoambassis ranga* (Hamilton, 1822)]
154.	**Latidae** (Lates perches)	*Lates calcarifer* (Bloch, 1790)*
155.	**Serranidae** (Groupers, Rock-cods)	*Epinephelus coioides* (Hamilton, 1822)**
156.		*Epinephelus lanceolatus* (Bloch, 1790) [Previously recorded as *Promicrops lanceolatus* (Bloch, 1790)]
157.		*Epinephelus malabaricus* (Bloch & Schneider, 1801)**
158.		*Epinephelus tauvina* (Forsskål, 1775)*
159.	**Sillaginidae** (Smelt Whitings)	*Sillaginopsis panijus* (Hamilton, 1822)
160.		*Sillago sihama* (Forsskål, 1775)*
161.		*Sillago vincenti* (McKay, 1880)**
162.	**Lactariidae** (False trevallies)	*Lactarius lactarius* (Bloch & Schneider, 1801)**
163.	**Rachycentridae** (Cobias)	*Rachycentron canadum* (Linnaeus, 1766)*
164.	**Echeneidae** (Sharksuckers, Discfishes)	*Echeneis naucrates* (Linnaeus, 1758)*
165.	**Carangidae** (Jacks, Trevallies, Pompanos & Scads)	*Alectis indicus* (Rüppell, 1830)*

(Continued)

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

166.		*Alepes djedaba* (Forsskål, 1775)*
167.		*Atule mate* (Cuvier, 1833)
168.		*Carangoides gymnostethus* (Cuvier, 1833)
169.		*Carangoides praeustus* (Bennett, 1830)*
170.		*Caranx ignobilis* (Forsskål, 1775)
171.		*Caranx melampygus* (Cuvier, 1833)
172.		*Caranx sexfasciatus* (Quoy & Gaimard, 1825)*
173.		*Megalaspis cordyla* (Linnaeus, 1758)*
174.		*Parastromateus niger* (Bloch, 1795) [Previously recorded as *Apolectus niger* (Bloch, 1795)]
175.		*Scomberoides commersonnianus* (Lacepède, 1801)**
176.		*Scomberoides lysan* (Forsskål, 1775)
177.		*Scomberoides tala* (Cuvier, 1832)*
178.		*Scomberoides tol* (Cuvier, 1832)**
179.		*Selar boops* (Cuvier, 1833)**
180.		*Selar crumenophthalmus* (Bloch, 1793)**
181.		*Selaroides leptolepis* (Cuvier, 1833)*
182.		*Trachinotus blochii* (Lacepède, 1801)
183.		*Trachinotus mookalee* (Cuvier, 1832)**
184.	**Leiognathidae** (Pony fishes)	*Eubleekeria splendens* (Cuvier, 1829) [Previously recorded as *Leiognathus splendens* (Cuvier, 1829)]
185.		*Gazza minuta* (Bloch, 1795)*
186.		*Leiognathus daura* (Cuvier, 1829)
187.		*Leiognathus dussumieri* (Valenciennes, 1835)*
188.		*Leiognathus equulus* (Forsskål, 1775)*
189.		*Leiognathus fasciatus* (Lacepède, 1803)**
190.		*Nuchequula blochii* (Valenciennes, 1835)* [Previously recorded as *Leiognathus blochii* (Valenciennes, 1835)]
191.		*Nuchequula gerreoides* (Bleeker, 1851**
192.		*Photopectoralis bindus* (Valenciennes,1835)** [Previously recorded as *Leiognathus bindus* (Valenciennes, 1835)]
193.		*Secutor insidiator* (Bloch, 1787)*
194.		*Secutor ruconius* (Hamilton, 1822)**
195.	**Lutjanidae** (Snappers)	*Lutjanus argentimaculatus* (Forsskål, 1775)*
196.		*Lutjanus johnii* (Bloch, 1792)*
197.		*Lutjanus kasmira* (Forsskål, 1775)*
198.		*Lutjanus russellii* (Bleeker, 1849)*
199.	**Datnioididae** (Freshwater tripletails)	*Datnioides polota* (Hamilton, 1822)* [Previously recorded as *Datnioides quadrifasciatus* (Sevastianov, 1809)]
200.	**Gerreidae** (Silver biddies)	*Gerres erythrourus* (Bloch, 1791)** [Previously recorded as *Gerres abbreviates* (Bleeker, 1850)]
201.		*Gerres filamentosus* Cuvier, 1829*
202.		*Gerres limbatus* Cuvier, 1830*
203.		*Gerres macracanthus* Bleeker, 1854
204.		*Gerres oyena* (Forsskål, 1775)*
205.		*Gerres phaiya* Iwatsuki & Hampstra, 2001 [Previously recorded as *Gerres poieti* Cuvier, 1830)]
206.		*Gerres setifer* (Hamilton, 1822)* [Previously recorded as *Gerreomorpha setifer* (Hamilton, 1822)]
207.	**Haemulidae** (Grunts & Rubberlips)	*Plectorhinchus nigrus* (Cuvier, 1830) [Previously recorded as *Plectorhinchus nigers* (Cuvier, 1830)]

(Continued)

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

208.		*Pomadasys argenteus* (Forsskål, 1775)*
209.		*Pomadasys kaakan* (Cuvier, 1830)**
210.		*Pomadasys multimaculatus* (Playfair, 1867)**
211.	**Sparidae** (Seabreams)	*Acanthopagrus berda* (Forsskål, 1775)*
212.		*Acanthopagrus latus* (Houttuyn, 1782)
213.		*Argyrops spinifer* (Forsskål, 1775)
214.		*Crenidens crenidens* (Forsskål, 1775)*
215.		*Rhabdosargus sarba* (Forsskål, 1775)*
216.	**Nemipteridae** (Threadfin breams)	*Nemipterus japonicus* (Bloch, 1791)**
217.	**Sciaenidae** (Croakers)	*Daysciaena albida* (Cuvier, 1830)*
218.		*Dendrophysa russelii* (Cuvier, 1829)*
219.		*Johnius carruta* (Bloch, 1793)**
220.		*Johnius dussumieri* (Valenciennes, 1837)
221.		*Johnius belangerii* (Cuvier, 1830)*
222.		*Johnius coitor* (Hamilton, 1822)
223.		*Johnius macropterus* (Bleeker, 1853)
224.		*Nibea maculata* (Bloch & Schneider, 1801)**
225.		*Otolithes ruber* (Bloch & Schneider, 1801)**
226.		*Otolithoides biauritus* (Cantor, 1849)
227.		*Otolithoides pama* (Hamilton, 1822)* [Previously recorded as *Pama pama* (Hamilton, 1822)]
228.		*Paranibea semiluctuosa* (Cuvier, 1830)*
229.		*Protonibea diacanthus* (Lacepède, 1802)*
230.	**Polynemidae** (Threadfinfishes)	*Eleutheronema tetradactylum* (Shaw, 1804)*
231.		*Leptomelanosoma indicum* (Shaw, 1804)* [Previously recorded as *Polydactylus indicus* (Shaw, 1804) & *Polynemus indicus* (Shaw, 1804)]
232.		*Polydactylus plebeius* (Broussonet, 1782)**
233.		*Polydactylus sextarius* (Bloch & Schneider, 1801)*
234.	**Mullidae** (Goatfishes)	*Upeneus sulphureus* (Cuvier, 1829)**
235.	**Drepaneidae** (Sicklefishes)	*Drepane punctata* (Linnaeus, 1758)*
236.	**Monodactylidae** (Moonies)	*Monodactylus argenteus* (Linnaeus, 1758)*
237.	**Nandidae** (Leaf fishes)	*Nandus nandus* (Hamilton, 1822)*
238.	**Terapontidae** (Terapon perches)	*Pelates quadrilineatus* (Bloch, 1790)
239.		*Terapon jarbua* (Forsskål, 1775)*
240.		*Terapon puta* (Cuvier, 1829)*
241.		*Terapon theraps* (Cuvier, 1829)*
242.	**Cichlidae** (Cichlids)	*Etroplus suratensis* (Bloch, 1790)*
243.		*Oreochromis mossambicus* (Peters, 1852)**
244.	**Uranoscopidae** (Stargazers)	*Ichthyoscopus lebeck* (Bloch & Schneider, 1801)* [Previously recorded as *Ichthyoscopus inermis* (Cuvier, 1829)]
245.	**Blenniidae** (Blennies & allies)	*Omobranchus zebra* (Bleeker, 1868)
246.	**Eleotridae** (Gudgeons)	*Butis butis* (Hamilton, 1822)
247.		*Eleotris fusca* (Forster, 1801)
248.		*Eleotris melanosoma* (Bleeker, 1852)**
249.	**Gobiidae** (Gobies)	*Acentrogobius cyanomos* (Bleeker, 1849)*
250.		*Acentrogobius griseus* (Day, 1876)
251.		*Acentrogobius masoni* (Day, 1873)
252.		*Acentrogobius viridipunctatus* (Valenciennes, 1837)

(Continued)

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

253.		*Amoya madraspatensis* (Day, 1868) [Previously recorded as *Acentrogobius madraspatensis* (Day, 1868)]
254.		*Bathygobius fuscus* (Ruppell, 1830)
255.		*Bathygobius ostreicola* (Chaudhuri, 1916)
256.		*Brachygobius nunus* (Hamilton, 1822)
257.		*Drombus globiceps* (Hora, 1923)*
258.		*Eugnathogobius mas* (Hora, 1923) [Previously recorded as *Glossogobius mas* Hora, 1923]
259.		*Glossogobius giuris* (Hamilton, 1822)*
260.		*Gobiopterus chuno* (Hamilton, 1822)
261.		*Oligolepis acutipennis* (Valenciennes, 1837)
262.		*Oligolepis cylindriceps* (Hora, 1923)*
263.		*Oxyurichthys microlepis* (Bleeker, 1849)*
264.		*Oxyurichthys tentacularis* (Vallenciennes, 1837)
265.		*Parapocryptes rictuosus* (Valenciennes, 1837)
266.		*Periophthalmus kalolo* (Lesson, 1831)* [Previously recorded as *Periophthalmus koelreuteri* (Pallas, 1770)]
267.		*Psammogobius biocellatus* (Valenciennes, 1837)* [Previously recorded as *Glossogobius biocellatus* (Vallenciennes, 1837)]
268.		*Pseudapocryptes elongatus* (Cuvier,1816) [Previously recorded as *Pseudapocryptes lanceolatus* (Bloch & Schneider, 1801)]
269.		*Pseudogobius javanicus* (Bleeker, 1856) [Previously recorded as *Stigmatgobius javanicus* (Bleeker, 1856)]
270.		*Stigmatogobius minima* (Hora, 1923)
271.		*Taenioides buchanani* (Day, 1873)
272.		*Trypauchen vagina* (Bloch & Schneider, 1801)*
273.		*Yongeichthys nebulosus* (Forsskal, 1775)**
274.	**Ephippidae** (Spadefishes)	*Ephippus orbis* (Bloch, 1787)**
275.		*Platax orbicularies* (Forsskål, 1775)**
276.	**Scatophagidae** (Scats)	*Scatophagus argus* (Linnaeus, 1766)*
277.	**Siganidae** (Spinsfoots, Rabbitfishes)	*Siganus canaliculatus* (Park, 1797)**
278.		*Siganus javus* (Linnaeus, 1766)*
279.		*Siganus vermiculatus* (Valenciennes, 1835)*
280.	**Acanthuridae** (Surgeon fishes)	*Acanthurus mata* (Cuvier, 1829)**
281.		*Acanthurus triostegus* (Linnaeus, 1758)**
282.	**Sphyraenidae** (Barracudas)	*Sphyraena jello* (Cuvier, 1829)**
283.		*Sphyraena putnamae* (Jordan & Seale, 1905)**
284.	**Trichiuridae** (Hairtail fishes)	*Eupleurogrammus glossodon* (Bleeker, 1860)**
285.		*Trichiurus lepturus* (Linnaeus, 1758)**
286.		*Lepturacanthus savala* (Cuvier, 1829)**
287.	**Scombridae** (Mackerels, Seerfishes, Tunas, Albacores)	*Euthynnus affinis* (Cantor, 1849)**
288.		*Rastrelliger kanagurta* (Cuvier, 1816)**
289.		*Scomberomorus lineolatus* (Cuvier, 1829)*
290.	**Anabantidae** (Climbing perches)	*Anabas cobojius* (Hamilton, 1822)*
291.		*Anabas testudineus* (Bloch, 1792)*

(Continued)

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

292.	**Osphronemidae** (Gouramies)	*Trichogaster fasciata* (Bloch & Schneider, 1801)* [Previously recorded as *Colisa fasciata* (Bloch & Schneider, 1801)]
293.		*Trichogaster lalius* (Hamilton, 1822)* [Previously recorded as *Colisa lalia* (Hamilton, 1822)]
294.	**Channidae** (Snakeheads, Murrels)	*Channa gachua* (Hamilton, 1822)**
295.		*Channa marulius* (Hamilton, 1822)**
296.		*Channa punctata* (Bloch, 1793)*
297.		*Channa striata* (Bloch, 1793)*
298.	**Paralichthyidae** (Lefteye flounders)	*Pseudorhombus arsius* (Hamilton, 1822)*
299.		*Pseudorhombus microgna*thus (Norman, 1927)**
300.		*Pseudorhombus triocellatus* (Bloch & Schneider, 1801)**
301.	**Soleidae** (Soles)	*Brachirus orientalis* (Bloch & Schneider, 1801)* [Previously recorded as *Eyriglossa orientalis* (Bloch & Schneider, 1801)]
302.		*Solea ovata* (Richardson, 1846)
303.	**Cynoglossidae** (Tongue soles)	*Cynoglossus lida* (Bleeker, 1851)**
304.		*Cynoglossus lingua* (Hamilton, 1822)*
305.		*Cynoglossus puncticeps* (Richardson, 1846)*
306.	**Triacanthidae** (Tripod fishes)	*Triacanthus biaculeatus* (Bloch, 1786)*
307.	**Balistidae** (Triggerfishes)	*Abalistes stellaris* (Bloch & Schneider, 1801)**
308.	**Tetraodontidae** (Puffers)	*Arothron reticularis* (Bloch & Schneider, 1801)
309.		*Arothron stellatus* (Bloch & Schneider, 1801)
310.		*Chelonodon patoca* (Hamilton, 1822)*
311.		*Lagocephalus lunaris* (Bloch & Schneider, 1801)
312.		*Takifugu oblongus* (Bloch, 1786)*
313.		*Tetraodon cutcutia* Hamilton, 1822*
314.		*Tetraodon fluviatilis* Hamilton, 1822* [Previously recorded as *Chelonodon fluviailis* (Hamilton, 1822)]
315.	**Diodontidae** (Porcupinefishes)	*Diodon hystrix* (Linnaeus, 1758)**
Shell fish Crabs		
316.	**Majidae** (Spider crabs)	*Doclea muricata* (Fabricius, 1787) [Previously reported as *Doclea hybrida* Edwards, 1834]
317.	**Calappidae** (Box crabs)	*Matuta planipes* (Fabricius, 1798)*
318.		*Ashtoret lunaris* (Forsskål, 1775)** [Previously reported as *Matuta lunaris* (Forsskål, 1775)]
319.	**Leucosiidae** (Nut crabs)	*Philyra malefactrix* (Kemp, 1915) [Previously reported as *Ebalia malefactrix* (Kemp, 1915)]
320.		*Philyra alcocki* (Kemp, 1915)*
321.	**Hymenosomatidae** (False spider crabs)	*Elamina (Trigonoplax) cimex* (Kemp, 1915)
322.	**Ocypodidae** (Ghost crabs and Fiddler crabs)	*Ocypode ceratophthalma* (Pallas, 1772)
323.		*Ocypode macrocera* (Edwards, 1852)*
324.		*Ocypode platytarsis* (Edwards, 1852)
325.		*Uca (Austruca) annulipes* (Edwards, 1837) [Previously reported as *Uca annulipes* (Edwards, 1837)]
326.		*Dotilla pertinax* (Kemp, 1915)
327.		*Dotilla intermedia* (de Man, 1888)
328.		*Dotilla myctiroides* (Edwards, 1852)

(Continued)

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

329.		*Euplax leptophthalmus* (Edwards, 1852) [Previously reported as *Macrophalmus gastrodes* (Kemp, 1915)]
330.		*Camptandrium sexdentatum* (Stimpson, 1858)
331.		*Baruna socialis* (Stebbing, 1904) [Previously reported as *Leipocten sardidulum* (Kemp, 1915)]
332.	**Grapsidae** (Marsh crabs)	*Pachygrapsus propinquus* (de Man, 1908)
333.		*Varuna litterata* (Fabricius, 1798)*
334.		*Ptychognathus onyx* (Alcock,1900)
335.		*Sesarma plicatum* (Latreille, 1806)
336.		*Neosarmatium meinerti* (De Man, 1887) [Previously reported as *Sesarma tetragonum* (Miers, 1879)]
337.		*Nanosesarma batavicum* (Moreira, 1903) [Previously reported as *Sesarma batavicum* (Moreira, 1903)]
338.		*Sesarma quadrata* (Fabricius, 1798)**
339.		*Plagusia squamosa* (Herbst, 1790) [Previously reported as *Plagusia depressa tuberculata* (Lamarck, 1818)]
340.		*Metopograpsus messor* (Forskål, 1775)
341.	**Gecarcinidae** (Land crabs)	*Cardisoma carnifex* (Herbst, 1796)
342.	**Xanthidae** (Pebble crabs or Rubble crabs)	*Benthopanope indica* (de Man, 1887) [Previously reported as *Heteropanope indica* (de Man, 1887)]
343.	**Portunidae** (Swimming crabs)	*Portunus (Portunus) pelagicus* (Linnaeus, 1758)* [Previously reported as *Portunus pelagicus* (Linnaeus, 1758)]
344.		*Portunus (Portunus) sanguinolentus* (Herbst, 1783)** [Previously reported as *Portunus sanguinolentus* (Herbst, 1783)]
345.		*Thalamita crenata* (Rüppell, 1830)*
346.		*Charybdis (Charybdis) feriata* (Linnaeus, 1758)** [Previously reported as *Charybdis cruciata* (Herbst, 1794)]
347.		*Charybdis (Charybdis) callianassa* (Herbst, 1789)** [Previously reported as *Charybdis callianassa* (Herbst, 1789)]
348.		*Scylla serrata* (Forskål, 1775)*
349.		*Scylla tranquebarica* (Fabricius, 1798)**
350.		*Podophthalmus vigil* (Fabricius, 1798)**
Shrimp and Prawns		
351.	**Penaeidae** (Penaeid shrimp)	*Penaeus monodon* (Fabricius, 1798)*
352.		*Penaeus semisulcatus* (De Haan, 1844)*
353.		*Fenneropenaeus indicus* (H. Milne Edwards, 1837)* [Previously reported as *Penaeus indicus* (Edwards, 1837)]
354.		*Melicertus canaliculatus* (Olivier, 1811)** [Previously reported as *Penaeus canaliculatus* (Olivier, 1811)]
355.		*Metapenaeus monoceros* (Fabricius, 1798)*
356.		*Metapenaeus affinis* (H. Milne Edwards, 1837)*
357.		*Metapenaeus dobsoni* (Miers, 1878)*
358.		*Metapenaeus ensis* (De Haan, 1844)**
359.	**Sergestidae** (Sergestid shrimps)	*Lucifer hanseni* (Nobili, 1905)
360.		*Philocheras hendersoni* (Kemp, 1915) [Previously reported as *Pontophilus hendersoni* (Kemp, 1915)]
361.	**Palaemonidae** (Palaemonid shrimps)	*Macrobrachium lamarrei lamarrei* (Edwards, 1837)*
362.		*Macrobrachium malcolmsonii malcolmsonii* (H. Milne Edwards, 1844)*

(Continued)

TABLE 13.2 **Inventory and Updated Checklist of Fish and Shellfish of Chilika Lagoon (1916–2012)**

		[Previously reported as *Macrobrachium malcolmsoni (*Edwards, 1844)]
363.		*Macrobrachium rude* (Heller, 1862)*
364.		*Macrobrachium scabriculum* (Heller, 1862)
365.		*Macrobrachium rosenbergii* (De Man, 1879)**
366.		*Macrobrachium equidens* (Dana, 1852)**
367.		*Exopalaemon styliferus* (H. Milne Edwards, 1840)*
368.		*Phycomenes indicus* (Kemp, 1915) [Previously reported as *Periclimenes (Periclimenes) indicus* (Kemp, 1915)]
369.		*Cuapetes demani* (Kemp, 1915)* [Previously reported as *Periclimenes (Harpilius) demani* (Kemp, 1915)]
370.	**Alpheidae** (Snapping shrimps)	*Ogyrides striaticauda* (Kemp, 1915)
371.		*Athanas polymorphus* (Kemp, 1915)
372.		*Alpheus lobidens* (De Haan, 1849) [Previously reported as *Periclimenes (Harpilius) demani* (Kemp, 1915) & *Alpheus crassimanus* (Heller, 1865)]
373.		*Alpheus malabaricus* (Fabricius, 1775)
374.		*Alpheus paludicola* (Kemp, 1915)
375.	**Atyidae** (Basket shrimp)	*Caridina nilotica* (Roux, 1833)
376.		*Caridina propinqua* (De Man, 1908)*
377.	**Pasiphaeidae** (Glass shrimp)	*Leptochela (Leptochela) aculeocaudata* (Paul'son, 1875)
378.	**Callianassidae** (Ghost shrimp)	*Neocallichirus maxima* (A. Milne-Edwards, 1870)* [Previously reported as *Callianassa (Callichirus) maxima* (Milne-Edwards, 1870)]
379.	**Upogebidae** (Mud shrimps)	*Wolffogebia heterocheir* (Kemp, 1915)* [Previously reported as *Upogebia (Upogebia) heterocheir* (Kemp, 1915).]
Lobsters		
380.	**Palinuridae** (Spiny lobsters)	*Panulirus polyphagus* (Herbst, 1793)**
381.		*Panulirus ornatus* (Fabricius, 1798)**
**Collection under post-restoration inventorial survey;* ***New records during post-restoration period.*		

CONCLUSION

Chirocentridae and Cobitidae could not be found, though 14 families were represented the first time after restoration. Out of the 315 species presently known from this lake, 65 species of fish could not be collected during the post-restoration period, most of them small gobioid fishes (16 species); that may possibly be due to change of habitat. *Eugnathogobius mas* was never reported after it was described. *Pristis pectinata*, once a widely distributed sawfish, has been almost eliminated from large areas of its former range, and so, its absence from Chilika lagoon nowadays indicates its elimination from these environs. *Glyphis gangeticus* is presently known only from the Ganges river system, Hooghly river mouth, West Bengal, India. Records of this species from Chilika lagoon may probably be based on some other similar species, such as *Carcharhinus leucas* (Valenciennes). Absence of several commercial fishes also points to overexploitation causing depletion of their population from coastal waters and so not entering the lagoon. Among the 35 species of crab species reported to date, only 14 species were reported during the post-restoration period, and only 18 prawn species out of the total reported 29 were recorded during the post-restoration phase. In total, 315 species of fishes (24 orders, 87 families and 196 genera), 35 crab species (9 families and 24 genera), 29 prawn species (8 families and 18 genera) and 2 lobsters (1 family and 1 genera) were reported so far from the Chilika lagoon.

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