

# ICHTHYOFAUNA IN THE PHONG NHA – KE BANG NATIONAL PARK FROM VIETNAM

HO ANH TUAN

Vinh University, Nghe An province, Vietnam, e-mail: [hoanhtuan18@gmail.com](mailto:hoanhtuan18@gmail.com)

Institutul de Zoologie al AȘM, Chișinău, str. Academiei 1, tel: 739 918

## ICHTIOFAUNA PARCULUI NAȚIONAL PHONG NHA-KE BANG DIN VIETNAM

**Rezumat.** Parcul national Phong Nha – Ke Bang este situat în nord-centrul Vietnamului. Acesta este caracterizat, în mare parte, printr-o structură tectonică calcaroasă, unde s-au format peste 300 de caverne, numeroase râuri subterane și o flora/faună de unicat, multe specii fiind incluse în Cartea Roșie a Vietnamului și Cartea Roșie Internațională (IUCN). În urma cercetărilor efectuate din 2003 până în 2011 în ihtiofauna parcului național Phong Nha – Ke Bang s-au depistat 119 specii de pești, aparținând la 89 genuri, 35 familii și 12 ordine. Dintre ele: 5 taxoni sunt incluși în Cartea Roșie a Vietnamului (2007), 65 specii sunt economic valoroase, 21 specii habitează în ecosistemele cavernicole, iar la 17 specii de pești arealul de răspândire s-a modificat, pătrunzând și pe teritoriul parcului național Phong Nha – Ke Bang.

## INTRODUCTION

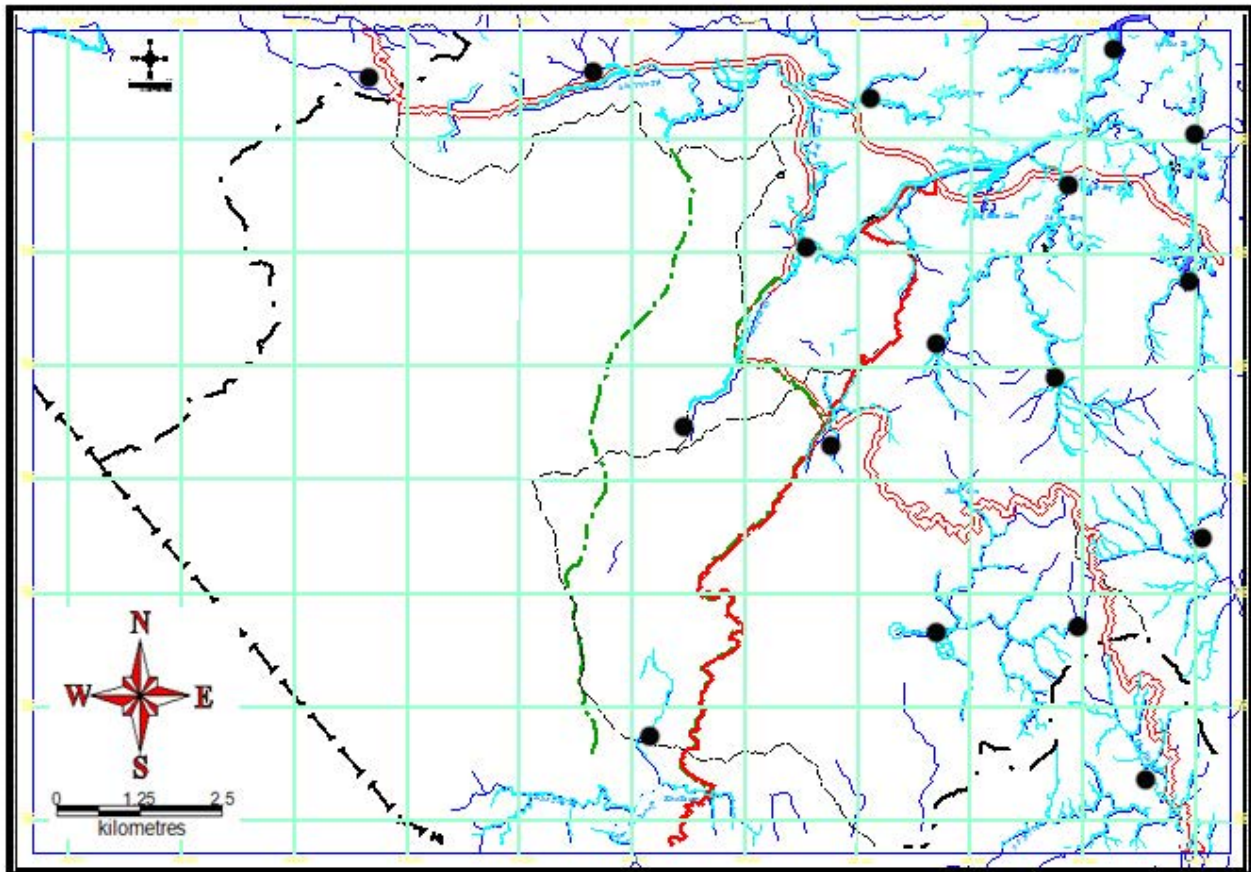
The Phong Nha – Ke Bang National Park locates in the range of coordinates from 17°21' to 17°39' north latitude and from 105°57' to 106°24' east longitude. This National Park is typically characterised by tectonic limestone structure with 300 caves, underground rivers and valuably rare flora and fauna in the Vietnam Red Book and World Red Book. Total length of cave system in this area is estimated about 80km but joint team of Vietnamese and English explorers only discovered 20 km, in which 17 km in Phong Nha area and 3 km in Ke Bang area. Due to naturally special block Karst Phong Nha - Ke Bang, phenomenon of underground water flowing is widespread. In this region, some small streams flow into the Rao Thuong channel with some opening punctuated segments and into cave system as underground river and then gathered into Chay River and Trooc river and creat a lagest tributary of the Gianh River.

Species composition of fish fauna in the Phong Nha – Ke Bang National Park were documented by Nguyen Thai Tu et al (1999) [26]. In these researches, 72 fish species were indentified, but 12 species were still unknown. In the period of 1998 to 2001,

researchers of Institute of Ecology and Biological Resources indentified 75 fish species, but 8 species were unknown [19]. In addition, 162 species were identified by Nguyen Thai Tu and Ho Anh Tuan (2003) [27], however there were 54 species are still not named. In the same year, Ngo Sy Van & Tran Anh Tuan also reported 121 species in this area but 23 species not identified [19]. These studies indicate the problem of fish species composition in the Phong Nha – Ke Bang National Park still under estimation, not the same classification and getting difficulty to named many species. This study aim to solve these difficulties with the title "Ichthyofauna in the Phong Nha - Ke Bang National Park from Vietnam".

## MATERIAL AND METHODS

Fish specimens were collected mainly from fishing men in these survey regions. Fishing tools are fishnets, rackets, casting – net, multi size fishing – rods and also professional tools of fish men such as: fishing basket, fishing traps, etc. Some other specimens was bought from local people. All samples were given full information in field trip diary, sampling notes, taking pictures and fixed with



**Figure 1.** Map study fish in Phong Nha – Ke Bang formaline 8- 10% and reserving with formaline 5% in Animal Laboratory of Department of Biology, Vinh University.

We use the following materials to Identification species: Chen Yiyu et al. (1998); Chu Xinluo, Chen Yinrui et al (1989); Chu Xinluo, Zheng, Bashan, Dai Dingyuan (1999); Do Thi Nhu Nhung (2007); Freyhof, J., D.V. Serov (2001); Freyhof, J. F. Herder (2002); Hartel K. E., T. Nakabo (2003); Imamura, H., M. Komada (2006); Johnson T. F. C., Herman T. C. W. (1965); Knapp, Smith, Heemstra (1986); Kotelat, M. (1990, 2000); Mai Dinh Yen (1978, 1992); Menon A. G. K. (1977); Nakabo T (1982, 1983); Nguyen Huu Phung (2001); Nguyen Khac Huong (1991, 2007); Nguyen Nhat Thi (1991, 2001); Nguyen Van Hao, Ngo Sy Van (2001); Nguyen Van Hao (Vol. 2, Vol. 3); Nguyen Van Luc, Le Thi Thu Thao, Nguyen Phi Uy Vu (2007); Prokofiev A. M. (2010); (Rainboth, W.J) 1996; Roberts, T. R. (1998); Tetsji Nakabo (2002); William P. D. (1966); Yokogawa K., H. Endo, H. Sakaji (2008); Yue Peiqi et al (2000);

List of classes, Orders, families and subfamilies is sorted by William N. Eschmeyer and Jon David Fong 2015. Genera of subfamilies and species of genera is sorted by a to z. [37, 38].

## RESULTS AND DISCUSSION

We conducted 12 field surveys in 2003 - 2011 at 17 study sites and collected 2349 specimens. Over time of analysis, we have identified 119 fish species belong to 89 genera, 35 families of 12 orders distributed in ichthyofauna of the Phong Nha - Ke Bang National Park from Vietnam. (Table 1)

According to Vietnam Red Book 2007 [16], there were 5 species identified in ichthyofauna of the Phong Nha - Ke Bang National Park belonging to conservation list such as: *Anguilla marmorata*, *Kon-*



**Figure 2.** *Anguilla marmorata*

*osirus punctatus*; *Hypsibarbus annamensis* (Level VU), *Clupanodon thrissa* (Level EN) and *Bostrychus sinensis* (Level CR). In which, 2 species: *Anguilla marmorata* and *Clupanodon thrissa*, were all found



Figure 3. *Clupanodon thrissa*



Figure 5. *Hypsibarbus annamensis*



Figure 4. *Konosirus punctatus*



Figure 6. *Bostrichthys sinensis*

Table 1

COMPOSITION OF FISH SPECIES IN ICHTHYOFAUNA PHONG NHA – KE BANG  
NATIONAL PARK

| Nº          | Scientific name                                   | RB | IUCN | EV | Cave |
|-------------|---|----|------|----|------|
| <b>I.</b>   | <b>ORDER OSTEOGLOSSIFORMES</b>                    |    |      |    |      |
| <b>(1).</b> | <b>FAMILY NOTOPTERIDAE</b>                        |    |      |    |      |
|             | <i>Notopterus notopterus</i> (Pallas, 1769)       |    | LC   | *  |      |
| <b>II.</b>  | <b>ORDER ANGUILLIFORMES</b>                       |    |      |    |      |
| <b>(2).</b> | <b>FAMILY ANGUILLIDAE</b>                         |    |      |    |      |
|             | <i>Anguilla marmorata</i> Quoy & Gaimard, 1824    | VU | LC   | *  | +    |
| <b>III.</b> | <b>ORDER CLUPEIFORMES</b>                         |    |      |    |      |
| <b>(3).</b> | <b>FAMILY CLUPEIDAE</b>                           |    |      |    |      |
|             | <i>Clupanodon thrissa</i> (Linnaeus, 1758)        | EN | NE   | *  |      |
|             | <i>Konosirus punctatus</i> (Tem. & Sch., 1846)    | VU | NE   | *  |      |
| <b>IV.</b>  | <b>ORDER CYPRINIFORMES</b>                        |    |      |    |      |
| <b>(4).</b> | <b>FAMILY CYPRINIDAE</b>                          |    |      |    |      |
| <b>1</b>    | <b>Subfamily Acheilognathinae</b>                 |    |      |    |      |
|             | <i>Acheilognathus lamus</i> Tu, 1983              |    | NE   |    |      |
|             | <i>Acheilognathus tonkinensis</i> (Vailant, 1892) |    | DD   |    | +    |
|             | <i>Rhodeus kyphus</i> (Yen, 1978)                 |    | NE   |    |      |
|             | <i>Rhodeus ocellatus</i> (Kener, 1867)            |    | DD   |    | +    |
|             | <i>Rhodeus spinalis</i> Oshima, 1926              |    | LC   |    |      |
| <b>2</b>    | <b>Subfamily Cultrinae</b>                        |    |      |    |      |
|             | <i>Hemiculter leucisculus</i> (Basilewsky, 1855)  |    | LC   | *  |      |
| <b>3</b>    | <b>Subfamily Cyprininae</b>                       |    |      |    |      |
|             | <i>Carassioides acuminatus</i> (Richardson, 1846) |    | LC   | *  |      |
|             | <i>Carassioides phongnhaensis</i> Tu & Tuan, 2003 |    | DD   |    |      |
|             | <i>Carassius auratus</i> (Linnaeus, 1785)         |    | LC   | *  |      |
|             | <i>Cyprinus carpio</i> Linnaeus, 1758             |    | VU   | *  |      |
|             | <i>Cyprinus hieni</i> Tu & Tuan, 2003             |    | DD   |    |      |
|             | <i>Cyprinus quidatensis</i> Tu, 1999              |    | DD   |    |      |
| <b>4</b>    | <b>Subfamily Barbinae</b>                         |    |      |    |      |
|             | <i>Puntius brevis</i> (Bleeker, 1849)             |    | LC   |    |      |

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|--------------|---|----|------|----|------|
|              | <i>Puntius semifasciolatus</i> (Günther, 1868)          |    | LC   |    |      |
| <b>5</b>     | <b>Subfamily Labeoninae</b>                             |    |      |    |      |
|              | <i>Cirrhinus molitorella</i> (Valenciennes, 1844)       |    | NT   | *  |      |
|              | <i>Garra imberba</i> Garman, 1912                       |    | DD   | *  | +    |
|              | <i>Osteochilus lini</i> Fowler, 1935                    |    | LC   |    |      |
|              | <i>Osteochilus salsburyi</i> Nichols & Pope, 1927       |    | LC   | *  |      |
| <b>6</b>     | <b>Subfamily Squaliobarbinae</b>                        |    |      |    |      |
|              | <i>Ctenopharyngodon idella</i> (Val., 1844)             |    | NE   | *  |      |
|              | <i>Squaliobarbus curriculus</i> (Richardson, 1846)      |    | DD   | *  |      |
| <b>7</b>     | <b>Subfamily Xenocyprinae (Xenocyprinae)</b>            |    |      |    |      |
|              | <i>Hypophthalmichthys molitrix</i> (Valenciennes, 1844) |    | NT   | *  |      |
| <b>8</b>     | <b>Subfamily Gobioninae</b>                             |    |      |    |      |
|              | <i>Hemibarbus umbrifer</i> (Lin, 1931)                  |    | LC   | *  |      |
|              | <i>Microphysogobio kachekensis</i> (Oshima, 1926)       |    | LC   | *  |      |
|              | <i>Sarcocheilichthys parvus</i> Nichols, 1930           |    | LC   |    |      |
|              | <i>Squalidus argentatus</i> (Sau. & Dab. Thi., 1874)    |    | DD   |    |      |
| <b>9</b>     | <b>Subfamily Danioninae</b>                             |    |      |    |      |
|              | <i>Devario fangfangae</i> (Kottelat, 2000) Add          |    | LC   |    |      |
|              | <i>Devario gibber</i> (Kottelat, 2000) Add              |    | LC   |    |      |
|              | <i>Esomus metallicus</i> Ahl, 1923 Add                  |    | LC   |    |      |
|              | <i>Esomus longimanus</i> (Lunel, 1881) Add              |    | DD   |    |      |
|              | <i>Rasbora steineri</i> Nichols & Pope, 1927            |    | LC   |    | +    |
| <b>10</b>    | <b>Incertae sedis Subfamily</b>                         |    |      |    |      |
|              | <i>Hypsibarbus annamensis</i> (Pel. & Che., 1936)       | VU | DD   | *  |      |
|              | <i>Hypsibarbus macrosquamatus</i> (Mai, 1978)           |    | DD   | *  |      |
|              | <i>Nicholsicypris dorsohorizontalis</i> Ng. & Do., 1969 |    | NE   | *  | +    |
|              | <i>Neolissochilus benasi</i> (Pellegrin & Chevey, 1936) |    | DD   | *  | +    |
|              | <i>Onychostoma gerlachi</i> (Peters, 1881)              |    | NT   | *  |      |
|              | <i>Opsariichthys bidens</i> Günther, 1873               |    | LC   | *  | +    |
|              | <i>Paraspinibarbus macracanthus</i> (Pel. & Che., 1936) |    | DD   | *  |      |
|              | <i>Poropuntius solitus</i> Kottelat, 2000 Add           |    | EN   | *  | +    |
|              | <i>Spinibarbus denticulatus</i> (Oshima, 1926)          |    | LC   | *  | +    |
|              | <i>Spinibarbus hollandi</i> Oshima, 1919                |    | DD   | *  |      |
| <b>11</b>    | <b>Subfamily Alburninae</b>                             |    |      |    |      |
|              | <i>Metzia lineata</i> (Pellegrin, 1907)                 |    | LC   |    |      |
| <b>(5).</b>  | <b>FAMILY COBITIDAE</b>                                 |    |      |    |      |
| <b>12</b>    | <b>Subfamily Cobitinae</b>                              |    |      |    |      |
|              | <i>Cobitis laoensis</i> (Sauvage, 1878)                 |    | LC   | *  | +    |
|              | <i>Misgurnus anguillicaulatus</i> (Cantor, 1842)        |    | NE   | *  | +    |
|              | <i>Misgurnus mizolepis</i> Günther, 1888                |    | NE   | *  | +    |
| <b>(6).</b>  | <b>FAMILY BALITORIDAE</b>                               |    |      |    |      |
|              | <i>Annamia normani</i> (Hora, 1931)                     |    | LC   |    |      |
|              | <i>Sewellia lineolata</i> (Valenciennes, 1836)          |    | VU   |    |      |
| <b>(7).</b>  | <b>FAMILY NEMACHEILIDAE</b>                             |    |      |    |      |
|              | <i>Schistura finis</i> Kottelat, 2000 Add               |    | DD   |    |      |
|              | <i>Schistura hingi</i> (Herre, 1934)                    |    | LC   | *  |      |
|              | <i>Schistura pervagata</i> Kottelat, 1998               |    | LC   | *  |      |
|              | <i>Schistura kottelati</i> Tuan et all Add              |    | NE   |    |      |
|              | <i>Traccatichthys taeniatus</i> (Pel. & Che., 1936)     |    | NE   | *  |      |
| <b>V.</b>    | <b>ORDER SILURIFORMES</b>                               |    |      |    |      |
| <b>(8).</b>  | <b>FAMILY BAGRIDAE</b>                                  |    |      |    |      |
|              | <i>Mystus gulio</i> (Hamilton, 1822)                    |    | LC   |    |      |
|              | <i>Hemibagrus centralus</i> Mai, 1978                   |    | DD   | *  |      |
|              | <i>Tachysurus virgatus</i> (Oshima, 1926)               |    | DD   | *  |      |
| <b>(9).</b>  | <b>FAMILY SILURIDAE</b>                                 |    |      |    |      |
|              | <i>Silurus asotus</i> Linnaeus, 1758                    |    | LC   | *  | +    |
|              | <i>Pterocryptis cochinchinensis</i> (Val., 1840)        |    | LC   | *  | +    |
| <b>(10).</b> | <b>FAMILY SISORIDAE</b>                                 |    |      |    |      |

| Nº           | Scientific name                                      | RB | IUCN | EV | Cave |
|--------------|--|----|------|----|------|
| <b>13</b>    | <b>Subfamily Glyptosterninae</b>                     |    |      |    |      |
|              | <i>Glyptothorax laosensis</i> Fowler, 1934 Add       |    | LC   |    |      |
|              | <i>Glyptothorax interspinalus</i> (Mai, 1978) Add    |    | NT   |    |      |
|              | <i>Glyptothorax quadriocellatus</i> (Mai, 1978)      |    | DD   |    |      |
|              | <i>Glyptothorax zanaensis</i> Wu, He & Chu, 1981 Add |    | NE   |    | +    |
| <b>(11).</b> | <b>FAMILY CLARIIDAE</b>                              |    |      |    |      |
|              | <i>Clarias fuscus</i> (Linnaeus, 1758)               |    | LC   | *  |      |
| <b>VI.</b>   | <b>ORDER AULOPIFORMES</b>                            |    |      |    |      |
| <b>(12).</b> | <b>FAMILY SYNODONTIDAE</b>                           |    |      |    |      |
| <b>14</b>    | <b>Subfamily Harpadontinae</b>                       |    |      |    |      |
|              | <i>Saurida elongata</i> (Tem. & Sch., 1846)          |    | NE   | *  |      |
| <b>VII.</b>  | <b>ORDER BELONIFORMES</b>                            |    |      |    |      |
| <b>(13).</b> | <b>FAMILY HEMIRAMPHIDAE</b>                          |    |      |    |      |
|              | <i>Hyporhamphus sinensis</i> (Günther 1866)          |    | LC   |    |      |
| <b>VIII.</b> | <b>ORDER SYNBRANCHIFORMES</b>                        |    |      |    |      |
| <b>(14).</b> | <b>FAMILY SYNBRANCHIDAE</b>                          |    |      |    |      |
|              | <i>Monopterus albus</i> (Zuiew, 1793)                |    | LC   | *  | +    |
| <b>(15).</b> | <b>FAMILY MASTACEMBELIDAE</b>                        |    |      |    |      |
|              | <i>Mastacembelus armatus</i> (Lacepède, 1800)        |    | LC   | *  | +    |
|              | <i>Sinobdella sinensis</i> (Bleeker, 1870)           |    | LC   | *  | +    |
| <b>IX.</b>   | <b>ORDER SCORPAENIFORMES</b>                         |    |      |    |      |
| <b>(16).</b> | <b>FAMILY PLATYCEPHALIDAE</b>                        |    |      |    |      |
|              | <i>Platycephalus indicus</i> (Linnaeus, 1758)        |    | DD   | *  |      |
| <b>X.</b>    | <b>ORDER PERCIFORMES</b>                             |    |      |    |      |
| <b>(17).</b> | <b>FAMILY AMBASSIDAE</b>                             |    |      |    |      |
|              | <i>Ambassis ambassis</i> (Lacepède, 1802)            |    | LC   |    |      |
| <b>(18).</b> | <b>FAMILY PERCICHTHYIDAE</b>                         |    |      |    |      |
|              | <i>Coreoperca whiteheadi</i> Boulenger, 1900         |    | LC   | *  |      |
| <b>(19).</b> | <b>FAMILY LATIDAE</b>                                |    |      |    |      |
|              | <i>Lates calcarifer</i> (Bloch, 1790)                |    | NE   | *  |      |
| <b>(20).</b> | <b>FAMILY TERAPONTIDAE</b>                           |    |      |    |      |
|              | <i>Terapon jarbua</i> (Forsskål, 1775)               |    | LC   | *  |      |
|              | <i>Pelates sexlineatus</i> (Quoy & Gaimard, 1825)    |    | LC   | *  |      |
| <b>(21).</b> | <b>FAMILY LEIOGNATHIDAE</b>                          |    |      |    |      |
|              | <i>Leiognathus equulus</i> (Forsskål, 1775)          |    | LC   |    |      |
| <b>(22).</b> | <b>FAMILY GERREIDAE</b>                              |    |      |    |      |
|              | <i>Gerres limbatus</i> Cuvier, 1830                  |    | LC   | *  |      |
|              | <i>Gerres decacanthus</i> (Bleeker, 1864)            |    | NE   |    |      |
|              | <i>Gerres filamentosus</i> Cuvier, 1829              |    | LC   | *  |      |
| <b>(23).</b> | <b>FAMILY MONODACTYLIDAE</b>                         |    |      |    |      |
|              | <i>Monodactylus argenteus</i> (Linnaeus, 1758)       |    | NE   |    |      |
| <b>(24).</b> | <b>FAMILY MUGILIDAE</b>                              |    |      |    |      |
|              | <i>Liza affinis</i> (Günther, 1861)                  |    | NE   | *  |      |
| <b>(25).</b> | <b>FAMILY CICHLIDAE</b>                              |    |      |    |      |
| <b>15</b>    | <b>Subfamily Pseudocrenilabrinae</b>                 |    |      |    |      |
|              | <i>Oreochromis niloticus</i> (Linnaeus, 1758)        |    | NE   | *  |      |
| <b>(26).</b> | <b>FAMILY ODONTOBUTIDAE</b>                          |    |      |    |      |
|              | <i>Sineleotris chalmersi</i> Nichols & Pope, 1927    |    | LC   | *  |      |
|              | <i>Sineleotris namxamensis</i> Chen & Kottelat, 2004 |    | DD   | *  |      |
| <b>(27).</b> | <b>FAMILY ELEOTRIDAE</b>                             |    |      |    |      |
| <b>16</b>    | <b>Subfamily Butinae</b>                             |    |      |    |      |
|              | <i>Bostrychus sinensis</i> Lacepède, 1801            | CR | LC   | *  |      |
|              | <i>Butis butis</i> (Hamilton, 1822)                  |    | LC   |    |      |
|              | <i>Butis koilomatodon</i> (Bleek, 1849)              |    | NE   |    |      |
| <b>17</b>    | <b>Subfamily Eleotrinae</b>                          |    |      |    |      |
|              | <i>Eleotris fusca</i> (Forster, 1801)                |    | LC   |    |      |
|              | <i>Eleotris melanosoma</i> Bleeker, 1853             |    | LC   |    |      |
| <b>(28).</b> | <b>FAMILY GOBIIDAE</b>                               |    |      |    |      |

| Nº           | Scientific name   | RB       | IUCN       | EV        | Cave      |
|--------------|---|----------|------------|-----------|-----------|
| <b>18</b>    | <b>Subfamily Gobionellinae</b>                            |          |            |           |           |
|              | <i>Oligolepis acutipennis</i> (Valenciennes, 1837)        |          | DD         |           |           |
|              | <i>Oxyurichthys microlepis</i> (Bleek, 1849)              |          | NE         |           |           |
|              | <i>Oxyurichthys tentacularis</i> (Valenciennes, 1837)     |          | NE         | *         |           |
|              | <i>Rhinogobius giurinus</i> (Rutter, 1897)                |          | LC         |           |           |
|              | <i>Rhinogobius leavelli</i> (Herre, 1935)                 |          | LC         | *         |           |
|              | <i>Tridentiger trigonocephalus</i> (Gill, 1859)           |          | NE         | *         |           |
|              | <i>Papuligobius uniporus</i> Chen & Kottelat, 2003        |          | DD         | *         |           |
| <b>19</b>    | <b>Subfamily Oxudercinae</b>                              |          |            |           |           |
|              | <i>Pseudapocryptes elongatus</i> (Cuvier, 1816)           |          | LC         | *         |           |
| <b>20</b>    | <b>Subfamily Gobiinae</b>                                 |          |            |           |           |
|              | <i>Acentrogobius nebulosus</i> (Forsskål, 1775)           |          | NE         |           |           |
|              | <i>Favonigobius aliciae</i> (Herre, 1936)                 |          | NE         |           |           |
|              | <i>Glossogobius giuris</i> (Hamilton, 1822)               |          | LC         | *         | +         |
|              | <i>Glossogobius olivaceus</i> (Tem. & Sch., 1845)         |          | LC         |           |           |
|              | <i>Paragobiodon echinocephalus</i> (Ruppell, 1828)        |          | NE         |           |           |
|              | <i>Psammogobius biocellatus</i> (Valenciennes, 1837)      |          | LC         |           |           |
|              | <i>Yongeichthys criniger</i> (Valenciennes, 1837)         |          | NE         |           |           |
| <b>(29).</b> | <b>FAMILY SCATOPHAGIDAE</b>                               |          |            |           |           |
|              | <i>Scatophagus argus</i> (Linnaeus, 1766)                 |          | LC         | *         |           |
| <b>(30).</b> | <b>FAMILY ANABANTIDAE</b>                                 |          |            |           |           |
|              | <i>Anabas testudineus</i> (Bloch, 1792)                   |          | DD         | *         |           |
| <b>(31).</b> | <b>FAMILY OSPHRONEMIDAE</b>                               |          |            |           |           |
| <b>21</b>    | <b>Subfamily Macropodusinae</b>                           |          |            |           |           |
|              | <i>Macropodus opercularis</i> (Linnaeus, 1758)            |          | LC         |           |           |
|              | <i>Macropodus spechti</i> Schreitmüller, 1936 Add         |          | DD         |           |           |
|              | <i>Macropodus erythropterus</i> Frey. & Her., 2002 Add    |          | DD         |           |           |
|              | <i>Trichopsis vittata</i> (Cuvier, 1831) Add              |          | LC         |           |           |
| <b>22</b>    | <b>Subfamily Luciocephalinae</b>                          |          |            |           |           |
|              | <i>Trichopodus trichopterus</i> (Pallas, 1770)            |          | LC         |           |           |
| <b>(32).</b> | <b>FAMILY CHANNIDAE</b>                                   |          |            |           |           |
|              | <i>Channa striata</i> (Bloch, 1793)                       |          | LC         | *         |           |
|              | <i>Channa gachua</i> (Hamilton, 1822)                     |          | LC         | *         | +         |
| <b>XI.</b>   | <b>ORDER PLEURONECTIFORMES</b>                            |          |            |           |           |
| <b>(33).</b> | <b>FAMILY PARALICHTHYIDAE</b>                             |          |            |           |           |
|              | <i>Paralichthys olivaceus</i> (Tem. & Sch., 1846) Add     |          | NE         |           |           |
| <b>(34).</b> | <b>FAMILY SOLEIDAE</b>                                    |          |            |           |           |
|              | <i>Aseraggodes xenicus</i> (Matsubara & Ochiai, 1963) Add |          | NE         | *         |           |
|              | <i>Heteromycteris japonicus</i> (Tem. & Sch., 1846) Add   |          | NE         |           |           |
|              | <i>Solea ovata</i> Richardson, 1846                       |          | NE         | *         |           |
| <b>XII.</b>  | <b>ORDER TETRAODONTIFORMES</b>                            |          |            |           |           |
| <b>(35).</b> | <b>FAMILY TETRAODONTIDAE</b>                              |          |            |           |           |
|              | <i>Lagocephalus sceleratus</i> (Gmelin, 1789) Add         |          | LC         |           |           |
| <b>Total</b> |   | <b>5</b> | <b>119</b> | <b>65</b> | <b>21</b> |

**Notes:** (1) Number the order; (2) Scientific name; (3) RB: Species in the Vietnam Red Book 2007; (4) IUCN: Species in the IUCN Red List of Threatened Species; (5) EV: Species with precious economic values; (6) Species distribute inside cave habitat; Not Evaluated (NE); Data Deficient (DD); Least Concern (LC); Near Threatened (NT); Vulnerable (VU); Endangered (En); Critically Endangered (CR); Add: Supplemental species in ichthyofauna of the Phong Nha - Ke Bang National Park from Vietnam

many time in high quantity. Some species such as *Hypsibarbus annamensis*, *Clupanodon thrissa* and *Bostrychus sinensis* were found only 1 time with low quantity. (Figure 2, 3, 4, 5, 6)

List of distributive fish species in ichthyofauna of the Phong Nha - Ke Bang National Park in the table 1 is recorded in the IUCN Red List of Threatened Species as below [39]: Not Evaluated (NE): 29 species; Data Deficient (DD): 25 species; Least Concern (LC): 58 species; Near Threatened (NT): 4 species; Vulnerable (VU): 2 species; Endangered (En): 1 species.

In our observation, there were 65 species providing quite high yield in in ichthyofauna of the Phong Nha - Ke Bang National Park tributary. These species are also precious marketing and local people consume them every day. Therefore, these species were considered as economic development for local fish – men in this ichthyofauna. Having 21 species distributed in caves, add the distribution area for 17 species in ichthyofauna of the Phong Nha - Ke Bang National Park.

### CONCLUSION

Twelfth survey on the fish species composition of in ichthyofauna of the Phong Nha - Ke Bang National Park from Vietnam were carried out from 2003 to 2011. 119 fish species belong to 89 genera, 35 families of 12 orders are recorded, 5 rare species recorded in the Red Book of Vietnam (2007), 65 species having economic value, species is recorded in the IUCN Red List of Threatened Species as below: Not Evaluated (NE): 29 species; Data Deficient (DD): 25 species; Least Concern (LC): 58 species; Near Threatened (NT): 4 species; Vulnerable (VU): 2 species; Endangered (En): 1 species. 21 species distributed in caves add the distribution area for 17 species in ichthyofauna of the Phong Nha - Ke Bang National Park.

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