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Quan Thai Ke**THE WEB - BASED TOOL FOR
IDENTIFICATION OF AMPHIBIAN
AND REPTILES PRESENTED IN
THREE WESTERN PROVINCES OF
SOUTH - EASTERN REGION, VIETNAM****ABSTRACT**

Based on checklist, the keys to the identification updating with the new name of species according to Sang Nguyen Van et al author of the book "Herpetofauna of Vietnam" publisher Chimaira published in 2009 and the biological and ecological data of 120 species of amphibian and reptiles known from the herpetofauna in three western provinces of South - Eastern region, South Vietnam was announced by Hoa Pham Van in 2005 to build the web-based tool for identification of species from this herpetofauna. It is the first online tool used with vietnamese interface for identifying 118 species from this herpetofauna. Therefore, it can help for users with a means to quickly and easily identify and lookup them than when they used the keys to the identification of amphibian and reptiles species printing in the printout version. This tool can be accessed via internet at <http://zoology.vietbiodata.net>.

Key words: Amphibia, DAR, database for Amphibian and Reptiles, Reptiles, South-Eastern region.

Three western provinces (BINH DUONG, BINH PHUOC, TAY NINH) of South-Eastern region in the South Vietnam is located in 10°25'-12°17'N and 105°48'-107°28'E. Natural area of it is 13566 square kilometers. Year average temperature from 26.2°C to 26.9°C. Average annual rainfall from 1813.1 to 2469.2mm and humidity is from 78 to 79 percent. Their vegetation is very diverse with evergreen forest, semi-evergreen forest, mixed forest of timber bamboo, grassland and scrub.

Studies on amphibian and reptiles species in the South Vietnam were conducted from 19th century (1875) by number of foreign scientists. Although these studies had not been completed and systematic, they covered several places in South Vietnam's internal and are mainly to detect species composition and distribution of amphibian and reptiles. The first research studying fully and systematically on herpetofauna of this region of the Hoa Pham Van was reported in 2005. This work has detected and recorded 88 reptile species belonging to 3 orders, 17 families

and 32 amphibian species belonging to 2 orders, 7 families.

From 2005 to 2009, there have been 4 new species of lizard be discovered, described and published by some other authors in this region. As a result, the total number of species currently known from this herpetofauna is 124 species comprising 92 reptiles belonging to 3 orders, 18 families and 32 amphibian species belonging to 2 orders, 7 families.

Based on the keys to identification of amphibian and reptiles and data on biology and ecology of species from herpetofauna in three western provinces of South - Eastern region, South Vietnam published by Hoa Pham Van in 2005[1], we have built the database for Amphibian and Reptiles (DAR) in the studied region which is accessible at <http://zoology.vietbiodata.net>.

Materials and methods

Data using to build database were obtained from information on the biological, ecological and taxonomic characteristics and keys to the

identification of amphibian and reptiles species from the herpetofauna in three western provinces of South - Eastern region, South Vietnam reported by Hoa Pham Van in 2005.

The checklist, data on biology and ecology of species and the keys to the identification of amphibian and reptiles species from the herpetofauna in three western provinces of South - Eastern region, South Vietnam updating with the new name of species according to Sang Nguyen Van et al, [2] used to build the database of website and the web-based tool for identification of amphibian and reptiles known from this herpetofauna.

Database is in-house developed and managed by MySQL

Keys for identification of amphibian and reptiles in the studied region are dichotomous keys. Each step of identification has only two alternatives which are identification features on body forming, position of eyes, the presence of

teeth, etc... The tool was in-house developed using Perl programming language and Hypertext Markup Language (HTML). DAR is accessible at <http://zoology.vietbiodata.net> which is a Linux-Apache-MySQL-Perl system.

Result and discussion

In three western provinces of South – Eastern region, South Vietnam, 124 species consist of 92 reptiles and 32 amphibian species were identified. The biological diversity in this area is very high with the representatives of many species presented in Vietnam. The diversity of reptiles is high with 92 species belonging to 3 orders, 18 families while 32 amphibian species belong to 2 orders, 7 families. Detailed information about scientific name, English name, Vietnamese name, taxonomy of each species were shown in Table 1. Biological and ecological information of each species were also recorded and stored in database for mining

Table 1

List of reptiles and amphibian species presented in examined region

Order number	Scientific name	English name	Vietnamese name
	AMPHIBIA Linnaeus, 1758	Class AMPHIBIA	Lớp Éch nhái
	Anura FISCHER VON WALDHEIM, 1813	Order Anura	Bộ Không đuôi
	I. Bufonidae GRAY, 1825	Family Bufonidae	Họ Cóc
1	<i>Dutaphrynus melanostictus</i> (SCHNEIDER, 1799)	Black-spined toad, Asian common toad, Common Sunda toad.	Cóc nhà.
2	<i>Ingerophrynus galeatus</i> (GÜNTHER, 1864)	Cambodian toad.	Cóc rừng.
	II. Hylidae RAFINESQUE, 1815	Family Hylidae	Họ Nhái bén
3	<i>Hyla simplex</i> BOETTGER, 1901	Annam treefrog.	Nhái bén nhỏ.
	III. Megophryidae BONAPARTE, 1850	Family Megophryidae	Họ Cóc bùn
4	<i>Leptobrachium pullum</i> (SMITH, 1921)	Chapa spadefoot toad.	Cóc mảy Hatxen.
5	<i>Xenophrys major</i> (Boulenger, 1908)	Anderson's spadefoot toad.	Cóc mắt bên.
	IV. Microhylidae GÜNTHER, 1858	Family Microhylidae	Họ Nhái bầu
6	<i>Caluella guttulata</i> (BLYTH, 1855)	Burmese squat frog, Blotched burrowing frog.	Ếnh ương đốm.

7	<i>Glyphoglossus molossus</i> GÜNTHER, 1869	Balloon frog, Broad-lipped frog.	Nhái lười.
8	<i>Kalophrynus interlineatus</i> (BLYTH, 1855)	Sumatra grainy frog, Spotted narrow-mouthed frog, Northern sticky frog, Snoring frog.	Cóc đốm.
9	<i>Kaloula pulchra</i> GRAY, 1831	Banded bull frog, Malaysian narrow-mouthed toad, Asiatic painted frog.	Ễnh ương thường.
10	<i>Microhyla berdmorei</i> (BLYTH, 1856)	Bermore's narrow-mouthed frog,	Nhái bầu bec mơ.
11	<i>Microhyla butleri</i> BOULENGER, 1900	Butler's pigmy frog, Butler's rice frog.	Nhái bầu but lơ.
12	<i>Microhyla fissipes</i> (BOULENGER, 1884)	Ornate pigmy frog.	Nhái bầu hoa, nhái đế.
13	<i>Microhyla pulchra</i> (HALLOWELL, 1861)	Guangdong rice frog.	Nhái bầu vân, ễnh ương nhỏ.
14	<i>Microhyla palmipes</i> BOULENGER, 1897 *	Pigmy frog.	Nhái bầu chân vịt
15	<i>Micryletta inornata</i> (BOULENGER, 1890)	Deli paddy frog, Jewel pigmy frog.	Nhái bầu trơn.
	V. Dicroglossidae ANDERSON, 1871	Family Dicroglossidae	Họ Ếch nhái thực
16	<i>Fejervarya cancrivora</i> (GRAVENHORST, 1829)	Marsh frog, Java wart frog, Mangrove frog, Crab-eating frog.	Ếch cua.
17	<i>Fejervarya limnocharis</i> (GRAVENHORST, 1829)	Grass frog, paddy frog, rice frog, asian pool frog.	Nhái, ngóe.
18	<i>Hoplobatrachus rugulosus</i> (WIEGMANN, 1834)	Common lowland frog, Chinese bullfrog, Taiwanese frog.	Ếch đồng, ếch, ếch ruộng.
19	<i>Limnonectes kuhlii</i> (TSCHUDI, 1838)	Kuhl's creek frog, Big-headed frog.	Ếch nhèo, ếch trơn, ếch nâu.
20	<i>Quasipaa verrucospinosa</i> (BOURRET, 1937)	Granular spiny frog.	Ếch gai sần, ếch núi, ếch da.
21	<i>Occidozyga lima</i> (GRAVENHORST, 1829)	Green puddle frog, Rough-skinned floating frog, java frog.	Cóc nước sần, ngóe sọc.
22	<i>Occidozyga vittata</i> (ANDERSSON, 1942)	Striped oriental frog, Forest puddle frog.	Cóc nước sọc, cóc nước nhỏ.
	VI. Ranidae RAFINESQUE, 1814	Family Ranidae	Họ Ếch nhái
23	<i>Hylarana erythraea</i> (SCHLEGEL, 1837)	Green paddy frog, red-eared frog, common greenback frog.	Chàng xanh.

24	<i>Hylarana guentheri</i> (BOULENGER, 1882)	Guenther's Amoy frog, Guenther's frog.	Chẫu, chẫu chàng, chàng chuộc.
25	<i>Hylarana leptoglossa</i> (COPE, 1868) *		Chàng lười.
26	<i>Hylarana macrodactyla</i> GÜNTHER, 1858	Guangdong frog, three- striped grass frog, long- legged grass frog.	Chàng hiu.
27	<i>Hylarana milleti</i> (SMITH, 1921)	Dalat frog, Millet's frog.	Chàng mi lê.
28	<i>Hylarana nigrovittata</i> (BLYTH, 1856)	Black-striped frog.	Ếch suối.
29	<i>Hylarana taipehensis</i> (VAN DENBURGH, 1909)	Two-striped grass frog, taipei frog.	Chàng đài bắc.
30	<i>Odorrana andersonii</i> (BOULENGER, 1882)	Golden crossband frog, Anderson's frog.	Chàng an đec son.
	VII. Rhacophoridae HOFFMAN, 1932	Family Rhacophoridae	Họ Ếch cây
31	<i>Polypedates leucomystax</i> (GRAVENHORST, 1829)	Java whipping frog, Four-lined treefrog.	Ếch cây mép trắng.
	Gymnophiona MÜLLER, 1831	Order Gymnophiona	Bộ Không chân
	Ichthyophiidae TAYLOR, 1968	Family Ichthyophiidae	Họ Ếch giun
32	<i>Ichthyophis bannanicus</i> YANG, 1984	Bannan caecilian.	Ếch giun, ếch giun ban na.
	REPTILIA Laurenti, 1786	Class REPTILIA	Lớp Bò sát
	Squamata OPPEL, 1811	Order Squamata	Bộ Có vảy
	Sauria MACARTNEY, 1803	Suborder Sauria	Phân bộ Thằn lằn
	I. Agamidae GRAY, 1827	Family Agamidae	Họ Nhông
01	<i>Physignathus cocincinus</i> CUVIER, 1829	Indochinese water dragon, Green water dragon, Asian water dragon.	Rồng đất
02	<i>Acanthosaura lepidogaster</i> (CUVIER, 1829)	Scales-bellied tree lizard, Brown pricklenape.	Ô rô vảy
03	<i>Bronchocela smaragdina</i> GÜNTHER, 1864	Emerald long-tailed agama, Guenther's bloodsucker.	Nhông đuôi dài s - ma - ra
04	<i>Calotes emma</i> GRAY, 1845	Forest crested lizard, Emma forest lizard.	Nhông em - ma

05	<i>Calotes mystaceus</i> DUMÉRIL & BIBRON, 1837	Moustached lizard, Blue-crested lizard, Indochinese forest lizard.	Nhông xám
06	<i>Calotes versicolor</i> (DAUDIN, 1802)	Garden fence lizard, Oriental garden lizard.	Nhông xanh
07	<i>Draco indochinensis</i> SMITH, 1928	Indochinese flying lizard, Indochinese gliding lizard.	Thằn lằn bay đông dương
08	<i>Draco maculatus</i> (GRAY, 1845)	Spotted flying lizard, Spotted gliding lizard.	Thằn lằn bay đốm
09	<i>Draco volans</i> LINNAEUS, 1758 **		Thằn lằn bay vạch
	II. Gekkonidae GRAY, 1825	Family Gekkonidae	Họ Tắc kè
10	<i>Gekko badenii</i> SZCZERBAK & NEKRASOVA, 1994	Baden gecko	Tắc kè bà đen
11	<i>Gekko gecko</i> (LINNAEUS, 1758)	Gecko, Tokay.	Tắc kè, các kè
12	<i>Hemidactylus bowringii</i> (GRAY, 1845)	Oriental leaf-toed gecko, Bowring's house gecko.	Thạch sùng bao rin
13	<i>Hemidactylus frenatus</i> SCHLEGEL, 1836	Common house gecko, Spiny-tailed house gecko.	Thạch sùng đuôi sần
14	<i>Hemidactylus garnotii</i> DUMÉRIL & BIBRON, 1836	Garnot's house gecko, Indo-Pacific gecko.	Thạch sùng đuôi đẹp, thạch sùng ga - not
	III. Lacertidae GRAY, 1825	Family Lacertidae	Họ Thằn lằn chính thức
15	<i>Takydromus sexlineatus</i> DAUDIN, 1802	Six-tripled long-tailed grass lizard, asian grass lizard.	Liu điu chỉ, liu điu sáu vạch
	IV. Scincidae GRAY, 1825	Family Scincidae	Họ Thằn lằn bóng
16	<i>Eutropis longicaudata</i> (HALLOWELL, 1856)	Long-tailed mabuya	Thằn lằn bóng đuôi dài
17	<i>Eutropis macularia</i> (BLYTH, 1853)	Bronze mabuya	Thằn lằn bóng đốm
18	<i>Eutropis multifasciata</i> (KUHL, 1820)	East Indian brown mabuya, many-lined sun skink, common sun skink.	Thằn lằn bóng hoa
19	<i>Lipinia vittigera</i> (BOULENGER, 1894)	Striped tree skink, Banded lipinia, Common striped skink.	Thằn lằn vạch

20	<i>Lygosoma bowringii</i> (GÜNTHER, 1864)	Christmas island grass-skink, Bowring's supple skink.	Thần lằn chân ngắn bao - ring
21	<i>Lygosoma quadrupes</i> (LINNAEUS, 1766)	Short-limbed supple skink.	Thần lằn chân ngắn thường
22	<i>Sphenomorphus rufocaudatus</i> DAREVSKY & NGUYEN, 1983	Red-tailed ground skink	Thần lằn phê - nô đuôi đỏ
	V. Varanidae GRAY, 1827	Family Varanidae	Họ Kỳ đà
23	<i>Varanus nebulosus</i> (GRAY, 1831)	Clouded monitor	Kỳ đà vân, kỳ đà khô
24	<i>Varanus salvator</i> (LAURENTI, 1786)	Water monitor	Kỳ đà hoa, kỳ đà nước
	Serpentes LINNAEUS, 1758	Suborder Serpentes	Phân bộ Rắn
	I. Typhlopidae MERREM, 1820	Family Typhlopidae	Họ Rắn giun
25	<i>Ramphotyphlops braminus</i> (DAUDIN, 1803)	Common blind snake, Flowerpot snake.	Rắn giun thường, rắn giun
26	<i>Typhlops diardii</i> SCHLEGEL, 1839	Indochinese blind snake, Diard's blind snake.	Rắn giun lớn, rắn giun đi - ac
	II. Cyndrophidae FITZINGER, 1843	Family Cyndrophidae	Họ Rắn hai đầu
27	<i>Cyndrophis ruffus</i> (LAURENTI, 1768)	Red-tailed pipe snake	Rắn trun, rắn hai đầu đỏ
	III. Pythonidae FITZINGER, 1826	Family Pythonidae	Họ Trăn
28	<i>Python molurus</i> (LINNAEUS, 1758)	Asiatic rock python, Indian python, Burmese python.	Trăn đất, trăn mốc
29	<i>Python reticulatus</i> (SCHNEIDER, 1801)	Reticulated python	Trăn gấm
	IV. Xenopeltidae BONAPARTE, 1845	Family Xenopeltidae	Họ Rắn móng
30	<i>Xenopeltis unicolor</i> REINWARDT, 1827	Sunbeam snake	Rắn móng, rắn hổ hành
	V. Acrochordidae BONAPARTE, 1831	Family Acrochordidae	Họ Rắn rằm ri
31	<i>Acrochordus javanicus</i> HORNSTEDT, 1787	Java file snake, elephant-trunk snake.	Rắn rằm ri cóc, rằm ri gia - va
	VI. Colubridae OPPEL, 1811	Family Colubridae	Họ Rắn nước
32	<i>Calamaria pavementata</i> DUMÉRIL, BIBRON & DUMÉRIL, 1854	Collared reed snake	Rắn mai gấm lát
33	<i>Ahaetulla nasuta</i> (LACEPÈDE, 1789)	Long-nosed whip snake, green vine snake.	Rắn roi mõm nhọn

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34	<i>Ahaetulla prasina</i> (REINHARDT, 1827)	Oriental whip snake, asian vine snake.	Rắn roi thường
35	<i>Boiga cyanea</i> (DUMÉRIL, BIBRON & DUMÉRIL, 1854)	Green cat snake	Rắn rào xanh
36	<i>Boiga dendrophila</i> (BOIE, 1827)	Mangrove snake, Gold- ringed cat snake	Rắn rào cây
37	<i>Boiga multomaculata</i> (BOIE, 1827)	Large-spotted cat snake, many-spotted cat snake.	Rắn rào đốm
38	<i>Boiga siamensis</i> NOOTPAND, 1971	Gray cat snake, eyed cat snake, ocellated cat snake	Rắn rào hoa
39	<i>Chrysopelea ornata</i> (SHAW, 1802)	Golden tree snake, Golden flying snake.	Rắn cườm
40	<i>Coelognathus flavolineatus</i> (SCHLEGEL, 1837)	Yellow-striped snake, Black copper rat nake, common malayan racer.	Rắn sọc vàng
41	<i>Coelognathus radiatus</i> (BOIE, 1827)	Copperhead racer, Radiated rat snake.	Rắn sọc dưa
42	<i>Dendrelaphis pictus</i> (GMELIN, 1789)	Common bronzeback, Painted bronzeback.	Rắn leo cây thường
43	<i>Dryocalamus davisonii</i> (BLANFORD, 1878)	Bridle snake, Blanford's bridle snake.	Rắn dẻ
44	<i>Gonyosoma oxycephalum</i> (BOIE, 1827)	Red-tailed rat snake, red-tailed racer	Rắn lay, rắn đuôi đỏ
45	<i>Lycodon capucinus</i> BOIE in BOIE, 1827	Common wolf snake	Rắn khuyết mũ
46	<i>Lycodon laoensis</i> GÜNTHER, 1864	Laotian wolf snake, Indochinese wolf snake.	Rắn khuyết Lào
47	<i>Lycodon subcinctus</i> BOIE, 1827	Malayan banded wolf snake	Rắn khuyết đai
48	<i>Oligodon barroni</i> (SMITH, 1916)	Barron's kukri snake	Rắn khiếm ba - ron
49	<i>Oligodon cinereus</i> (GÜNTHER, 1864)	Ashy kukri snake, Guenther's kukri snake.	Rắn khiếm xám
50	<i>Oligodon fasciolatus</i> (GÜNTHER, 1864)	Fasciolated kukri snake.	Rắn khiếm đuôi vòng
51	<i>Oligodon formosanus</i> (GÜNTHER, 1872)	Taiwan kukri snake	Rắn khiếm đài loan
52	<i>Oligodon mouhoti</i> (BOULENGER, 1914)	Mouhot's kukri snake	Rắn khiếm mau- hô-ti
53	<i>Oligodon ocellatus</i> (MORICE, 1875)	Ocellated kukri snake.	Rắn khiếm vân đen
54	<i>Oligodon taeniatus</i> (GÜNTHER, 1861)	Striped kukri snake.	Rắn khiếm vạch

55	<i>Ptyas carinata</i> (GÜNTHER, 1858)	Carinated rat snake, Keel rat snake..	Rắn ráo gờ, rắn hổ mực gờ
56	<i>Ptyas korros</i> (SCHLEGEL, 1837)	Indochinese rat snake, Chinese rat snake.	Rắn ráo thường, rắn ráo, rắn lai
57	<i>Ptyas mucosa</i> (LINNAEUS, 1758)	Common rat snake, Oriental rat snake.	Rắn ráo trâu, rắn hổ trâu
58	<i>Enhydris bocourti</i> (JAN, 1865)	Bocourt's water snake	Rắn bông voi, rắn ri tượng, ri voi
59	<i>Enhydris enhydris</i> (SCHNEIDER, 1799)	Rainbow water snake	Rắn bông súng
60	<i>Enhydris innominata</i> (MORICE, 1875)	Mekong delta water snake	Rắn bông không tên, rắn hổ lác
61	<i>Enhydris plumbea</i> (BOIE in BOIE, 1827)	Plumbeous water snake	Rắn bông chì, rắn liu điu
62	<i>Enhydris subtaeniata</i> (BOURRET, 1934)	Mekong mud snake	Rắn bù lịch, Rắn bông mê - kông
63	<i>Erpeton tentaculatum</i> LACEPÈDE, 1800	Tentaculed snake	Rắn râu
64	<i>Homalopsis buccata</i> (LINNAEUS, 1758)	Puff-faced water snake, masked water snake.	Rắn ri cá
65	<i>Amphiesma stolatum</i> (LINNAEUS, 1758)	Buff-striped keelback	Rắn sãi thường
66	<i>Psammodynastes pulverulentus</i> (BOIE, 1827)	Mock viper	Rắn hổ đất nâu
67	<i>Rhabdophis subminiatus</i> (SCHLEGEL, 1837)	Red-necked keelback	Rắn hoa cỏ nhỏ
68	<i>Xenochrophis flavipunctatus</i> (HALLOWELL, 1861)	Yellow-spotted keelback	Rắn nước, rắn nước đốm vàng
69	<i>Pareas carinatus</i> (BOIE, 1828)	Keel slug snake	Rắn hổ mây gờ
70	<i>Pareas laevis</i> (BOIE in BOIE, 1827) ***	Slug snake.	Hổ mây trơn
71	<i>Pareas margaritophorus</i> (JAN, 1866)	White- spotted slug snake.	Hổ mây ngọc, rắn hổ mây đốm trắng
	VII. Elapidae BOIE, 1827	Family Elapidae	Họ Rắn hổ
72	<i>Bungarus candidus</i> (LINNAEUS, 1758)	Blue krait.	Rắn cạp nia nam
73	<i>Bungarus fasciatus</i> (SCHNEIDER, 1801)	Banded krait.	Rắn cạp nong, rắn đen vàng
74	<i>Naja siamensis</i> LAURENTI, 1768	Indochinese spitting cobra, siamese cobra.	Rắn hổ mang xiêm
75	<i>Ophiophagus hannah</i> (CANTOR, 1836)	King cobra, hamadryad.	Rắn hổ chúa, Rắn hổ mang đen
76	<i>Calliophis maculiceps</i> (GÜNTHER, 1858)	Small-spotted coral snake.	Rắn vú nàng, Rắn lá khô đốm nhỏ

	VIII. Viperidae OPPEL, 1811	Family Viperidae	Họ Rắn lục
77	<i>Calloselasma rhodostoma</i> (KUHLE, 1824)	Malayan pitviper.	Rắn chòam quạp, rắn lục mã lai
78	<i>Criptelytrops albolabris</i> (GRAY, 1842)	White-lipped pitviper, White-lipped tree viper.	Rắn lục mép trắng
79	<i>Tropidolaemus wagleri</i> (BOIE, 1827)	Temple pitviper.	Rắn lục wag - lo
	Testudines LINNAEUS, 1758	Order Testudines	Bộ Rùa
	I. Geoemydidae THEOBALD, 1868	Family Geoemydidae	Họ Rùa thường
80	<i>Cuora amboinensis</i> (DAUDIN, 1801)	Malayan box turtle, Asian box turtle, Southeast Asian box turtle.	Rùa hộp lưng đen
81	<i>Cyclemys dentata</i> (GRAY, 1831)	Asian leaf turtle.	Rùa dứa
82	<i>Cyclemys tcheponensis</i> (BOURRET, 1939)	Stripe-necked leaf turtle.	Rùa đất sê - pôn
83	<i>Heosemys annandalii</i> (BOULENGER, 1903)	Yellow-headed temple turtle.	Rùa răng, càng đước
84	<i>Heosemys grandis</i> (GRAY, 1860)	Giant asian pond turtle.	Rùa đất lớn
85	<i>Siebenrockiella crassicollis</i> (GRAY, 1831)	Black marsh turtle, Siamese temple turtle.	Rùa cổ bự
	II. Testudinidae GRAY, 1825	Family Testudinidae	Họ Rùa núi
86	<i>Indotestudo elongata</i> (BLYTH, 1853)	Elongated tortoise.	Rùa núi vàng, rùa gỏi, rùa voi
	III. Trionychidae FITZINGER, 1826	Family Trionychidae	Họ Ba ba
87	<i>Amyda cartilaginea</i> (BODDAERT, 1770)	Asiatic softshell turtle, Black-rayed softshell turtle.	Cua đĩnh, ba ba nam bộ
	Crocodylia GMÉLIN, 1789	Order Crocodylia	Bộ Cá sấu
	Crocodylidae GRAY, 1825	Family Crocodylidae	Họ Cá sấu
88	<i>Crocodylus siamensis</i> SCHNEIDER, 1801	Siamese crocodile.	Cá sấu xiêm, cá sấu nước ngọt

Notes: Species:* according Bourret R. (1942)

*Species**:* according Bourret R. (1943)

*Species***:* according Bourret R. (1936)

Based on the data and the characteristic of the identification key, a relational database structure was built with 10 tables, in which, 6 tables contains information on different taxonomy levels, 3 tables contain features for identification

at 3 taxonomy levels (family, genus, species), 1 table for the biological information of recorded species. Data in these table is connected by defined relationships as shown in the figure 1.

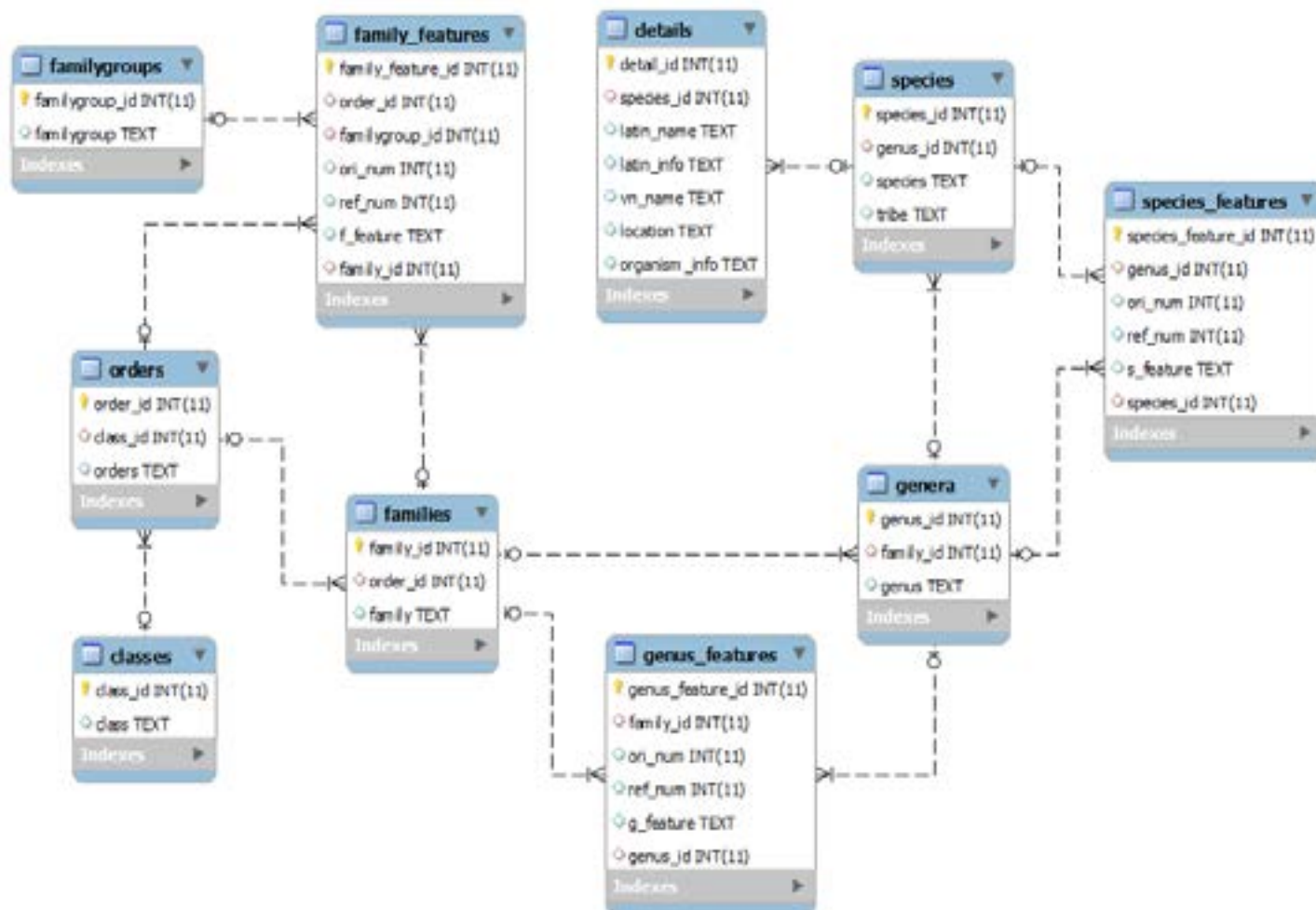


Figure 1: Relational database structure of the DAR

For ease in accessing the data and identification of reptiles and amphibian in the studied region, a website was built and accessible at <http://zoology.vietbiodata.net>. Webpages are in Vietnamese, since most of users should be Vietnamese students or researchers. However, for more friendly, an English version has been developing and going to be available soon.

Data stored in DAR can be mined in different ways. A list of 120 identified species is shown, in which, species are grouped based on taxonomy features. A link to the details of each corresponding species are also established as shown in Figure 2.

DANH LỤC CÁC LOÀI

Ớp AMPHIBIA Linnaeus, 1758 - Éch nhái
Bộ Anura FISCHER VON WALDHEIM, 1813 (Bộ Không đuôi)
Họ Bufonidae GRAY, 1825 (Họ Cóc)
<i>Dutaphrynus melanostictus</i>
<i>Ingerophrynus galeatus</i>
Họ Hylidae RAFINESQUE, 1815 (Họ Nhái bén)
<i>Hyla simplex</i>
Họ Megophryidae BONAPARTE, 1850 (Họ Cóc bùn)
<i>Leptobrachium pullum</i>
<i>Megophrys longipes</i>
Họ Microhylidae GÜNTHER, 1858 (Họ Nhái bầu)
<i>Caluella guttulata</i>
<i>Glyphoglossus molossus</i>
<i>Kalophrynus interlineatus</i>
<i>Kaloula pulchra</i>
<i>Microhyla berdmorei</i>
<i>Microhyla butleri</i>
<i>Microhyla fissipes</i>
<i>Microhyla pulchra</i>
<i>Microhyla palmipes</i>
<i>Micryletta inornata</i>

Figure 2: List of identified species

Detail information of species consists of scientific name, Vietnamese name, biological features, location of distribution... as shown in Figure 3.

<i>Dutaphrynus melanostictus</i>	
Tên khoa học	<i>Dutaphrynus melanostictus</i> (SCHNEIDER, 1799)
Thông tin tên khoa học	1799. Bufo melanostictus Schneider - Hist. Amph. Jena, 1, p. 216 (địa điểm typus: India orientali); 1937. Bufo tienhoensis botzret
Tên thường gọi	Cóc nhà. Tên tiếng Anh: Asian common toad.
Phân bố	Gặp khắp nơi trong khu vực.
Đặc điểm	<p>Vật mẫu: NS A8 (Ninh Sơn), NTh A17, LA 3 NTh (Ninh Thuận).</p> <p>Tuyến mang tai hình hạt đậu, dài và phẳng. Màng nhĩ rõ. Dài màng nhĩ hơi lớn hơn 2/3 đường kính mắt. Các ngón tay tự do. Ngón tay I dài hơn ngón II. Ngón chân gần 1/2 có màng. Cú bản ngoài bằng 3/4 củ bản trong. Khớp cổ bản chạm mắt. Mặt lưng màu vàng, vàng đen, đỏ nâu hay xám nhạt, có nhiều mụn to nhỏ không đều (đám các mụn đôi khi có màu đỏ gạch). Mặt bụng màu vàng xám hay đỏ gạch nhạt, rải rác có các vết đen và các mụn nhỏ trong đôi đều nhau. Vùng trên đầu trơn. Đầu mít các ngón màu đen. L: (18 - 90)mm.</p>
	

Figure 3: Detail information of an amphibia

The identification tool is also included in the website. A Perl script was developed using the reported keys for identification of amphibian and reptiles. Every step, two options which are

identification features are shown, one of them must be chosen for further identification. Pages with options would be repeated until a species is identified (Figure 4).



Figure 4: Steps in identification

Conclusion

The database of reptiles and amphibian in western provinces of South-eastern region, Vietnam was established and can be accessed freely via Internet with webpages interface. It provides not only biological information about species in studied region but also the tool for identification of reptiles and amphibian. The tool is very user-friendly, can be used easily just by choosing the correct feature of the sample. In the near future, we will broaden the examined region as well as contribute to other groups to achieve a full database of reptiles and amphibian in Vietnam.

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