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Reference Database File TABR Based on Tropical Asian Bees

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Abstract. A reference database file, TABR, based on tropical Asian bees was constructed and is available to the public via the Internet. Each record is composed of 11 items, and consists of scientific names (family, genus and species), distribution data, type designation with sex, type locality, type depository, source of the original description, synonymy, references and notes. A home page and an example of a search of the TABR database is presented. It is administered by a SIGMA management system. A user can access the database file by visiting the following URL: <http://konchudb.agr.agr.kyushu-u.ac.jp/tabr/>.

Key words: bioinformatics, entomology database, tropical Asian bees, TABR, SIGMA.

We have produced five main insect database files, KONCHUR, MOKUROKU, DJI, HANABACHI, and TOBIKOBACHI in the KONCHU database at the Computer Center of Kyushu University (present: Research Institute for Information Technology, Kyushu University) since 1983 and have opened to the public via the Internet servers of the Entomological Laboratory and the above institution of Kyushu University (Tadauchi, 1987, 1994; Tadauchi *et al.*, 1999, 2001, 2003; Tadauchi & Inoue, 2000a, b).

Michener (1979) pointed out that bees appear to attain their great abundance, greatest numbers of species, and probably greatest numbers of genera and subgenera, not in the tropics, but in various warm-temperate, xeric regions of the world. At the level of family and tribe, the Neotropical Region has the most diversity, followed by the Nearctic, and then Palaearctic, and Africa. The Oriental Region has 26 subfamilies and tribes and shows fewer taxa at higher ranks in the world (Michener, 2000). Since Fabricius (1775) described some bees, including *Apis cerana* and *Apis dorsata* from tropical Asia, many investigators have reported bees from this area. The most comprehensive works of bees in tropical Asia were published as the Fauna of British India including Ceylon and Burma by Bingham (1897). Europe-

ans were the main researchers who then studied tropical Asian bees in the first half of the 20th century. But on the whole it may be said that studies of bees in this area are inadequate at the present time, compared with those of Africa and South America. Michener (1965) presented a monograph of bees in the neighboring areas of Australia and the Pacific Islands. But a comprehensive work on bees in tropical Asia is absent. It is, therefore, necessary for investigators in this area to search sporadic references. Furthermore, it is important to construct a database of bees in tropical Asia for future studies.

We have constructed two files, representing image and reference databases of tropical Asian bees. One of the files, reference database TABR is based on main articles related to tropical Asian bees and is open to the public via the Internet. Each record is composed of 11 items with the following tags:

1. (FTAX) family (scientific name, including subfamily name)
2. (GTAX) genus (scientific name, including subgenus name)
3. (STAX) species (scientific name, including subspecies)
4. (DST) distribution
5. (TYPE) type (sex)



Fig. 1. A home page of a reference database TABR based on tropical Asian bees in English version.

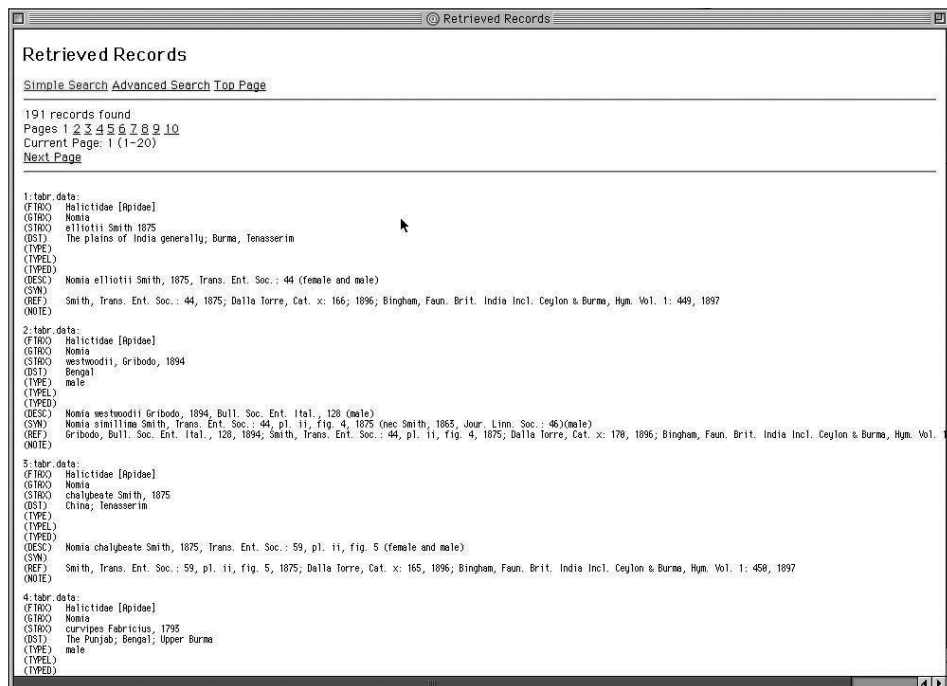


Fig. 2. Example of result of a search of the reference database TABR by a keyword, *Nomia*.

6. (TYPEL) type locality
7. (TYPED) depository of the type
8. (DESC) source of the original description
9. (SYN) synonymy
10. (REF) references
11. (NOTE) notes

An example of a record is as follows:

```
#
(FTAX) Apidae
(GTAX) Xylocopa
(STAX) javana Friese, 1914
(DST) Java (Buitenzorg)
(TYPE) female
(TYPEL) Java (Buitenzorg)
(TYPED) Coll. Friese
(DESC) Xylocopa javana Friese, 1914, Tijdschr. Ent.
Vol. 57: 7, 32 (female)
(SYN)
(REF)
(NOTE)
```

The database is written in English and is administered by a SIGMA text database management system working at a workstation in the Entomological Laboratory at Kyushu University.

A user can presently access the TABR database file by visiting the following URL: <http://konchudb.agr.agr.kyushu-u.ac.jp/tabr/>.

The home page of the TABR database is presented in Fig. 1. The operation of the SIGMA system is explained in Arikawa et al. (1987, 1988).

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Book Review

“Scientific Names of Animals, Plants and Bacteria.”
Author: Yoshihiro Hirashima, 2007, Tokyo University Press, Tokyo, xxii+1292 pp., 47,250 yen (In Japanese).

The title of this book should read as “A Dictionary of Latin and Greek used in Scientific Names of Animals, Plants and Bacteria”. This voluminous book is really a wonderful dictionary of Latin and Greek used in scientific names. This is also a useful textbook for scientists of natural history whether they are beginners or not.

You can easily learn from this book Latin and Greek words of prefixes, suffixes, diminutives, and other words in relation to common adjectives (e.g., ambiguous, distinctive, soft, strong or weak, etc.), color (e.g., black, red, yellow, white, etc.), shape (e.g., angulate, circular, conical, triangle, etc.), surface structure (e.g., bare, corrugated, smooth, stripped, etc.), animal structure (e.g., body, eye, head, leg, mouth, etc.), plant structure (e.g., flower, fruit, root, twig, trunk, etc.), environment (e.g., cave, moon, river, season, snow, star, water, etc.) and animal behavior (e.g., eat, fly, love, migrate, play, run, swim, etc.). Undoubtedly you can get indispensable and useful information from this unparalleled dictionary, essentially in case of describing new taxa.

It is a comprehensive, fully cross-referenced collection of approximately 35,000 terms and references thousands of species of organisms. In addition, this tome includes 119 interesting boxes (stories) on topics relevant to academic communities and anecdotes of scientific names, and also contains 371 (345+26) figures and photos of interesting mammals, birds, fishes, shells, insects, plants and others. Many of those interesting photos were taken by the author at domestic and foreign aquaria, botanical gardens (including the Cue Garden) and zoological gardens (including the Zoo of London).

This book also provides a drill on naming a new generic name of Nitidulid beetle of unusual shape. This will stimulate an interest of both systematists and general biologists.

This dictionary is divided into 12 chapters as follows:

- Chapter 1. Inflection in Latin and Greek. 110 examples.
- Chapter 2. Prefixes. 77 examples.
- Chapter 3. Suffixes. 202 examples.
- Chapter 4. Diminutives. 49 examples.

- Chapter 5. Common adjectives. 1041 basic words.
- Chapter 6. Terms related to color. 322 basic words.
- Chapter 7. Terms related to shape and measurement. 735 basic words.
- Chapter 8. Terms related to surface structure. 173 basic words.
- Chapter 9. Terms related to structure in animals. 338 basic words.
- Chapter 10. Terms related to structures in plants. 169 basic words.
- Chapter 11. Terms related to environments. 497 basic words.
- Chapter 12. Terms related to behavior of animals. 1018 basic words.

This is undoubtedly a monumental work, and is estimated as essential for not only biologists but also the public libraries, university libraries, institutions and museums of natural history. We congratulate and thank the author, Prof. Emeritus Y. Hirashima of Kyushu University, who wrote this fine book of scientific names on the occasion of Linne's three hundredth anniversary of birth.

He is also the author of other six books on scientific names, as shown below.

- 1987 Butterflies. Etymology of their Scientific Names. Kyushu University Press, Fukuoka, 269 pp. (In Japanese.)
- 1989 Essays of Scientific Names of Animals. Their Composition and Meaning. Kyushu University Press, Fukuoka, 380 pp. (In Japanese.)
- 1990 Spiders. Etymology of their Scientific and Japanese Names. Kyushu University Press, Fukuoka, 287 pp. (with T. Yaginuma and C. Okuma, In Japanese.)
- 1994 Dictionary of Scientific Names, with Special Reference to Primates, Plants and Microbes. Heibonsha, Tokyo, 493 pp. (In Japanese.)
- 1999 Butterflies. Etymology of their Scientific Names. New Edition. Kyushu University Press, Fukuoka, 714 pp. (In Japanese.)
- 2002 A textbook of Scientific Names. Tokyo University Press, Tokyo, 249 pp. (In Japanese.)

(Tadauchi, O. and S. Kamitani)