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## World Traditional Medicine Patent Database and its applications



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## A B S T R A C T

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World Traditional Medicine Patent Database (WTMPD), a bilingual (Chinese/English) and deep indexed natural/traditional medicine patent database, covers more than 200 k natural/traditional medicine related basic patent records (more than 500 k patent family members) and more than 200 k Traditional Chinese Medicine (TCM) formulas collected from 20+ countries and 2 international organizations from 1985 to current. WTMPD has been used in patent examination practice within SIPO of China. The database has, for example, enhanced subject search, formula similarity search, chemical structure search, and traditional medicine dictionary search. WTMPD is useful for both patent searching and drug discovery.

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## 1. Introduction

The World Traditional Medicine Patent Database (WTMPD) has been developed to contain a large number of natural/traditional medicine related patents collected from 20+ countries and 2 international organizations since 1985, and for use in both patent searching and drug discovery. The WTMPD covers information on, for example, formula, preparation method, new therapeutic use, active ingredient extraction process, planting process, and analytic processes. It includes more than 200 k deep-indexed basic patents (more than 500 k patent family members) and more than 200 k Traditional Chinese Medicine (TCM) formulas. The languages of the source patents involve Chinese, English, Japanese, Korean, Russian, German, French and Spanish. Search entries and criteria are available in both Chinese and English languages [1–3].<sup>1</sup>

WTMPD contains bibliographic information file with deep-indexed data. Some auxiliary files, including Natural Medicine Registration File, Compound Registration File, synonym file and TCM classification code system are integrated to improve system searching functions. Deep indexing and much enhanced search functions greatly increased the search recall and precision.

## 2. Database structure

The WTMPD is composed of one bibliographic file and some auxiliary files which are used to improve the database's searching

recall and precision. The patent bibliographic file is the kernel file which covers more than 200 k deep indexed basic patent records in nature/traditional field. The auxiliary files are mainly:

1. Traditional dictionary, which includes more than 18 k natural/traditional drugs from worldwide with unique code and can be crossed to patent bibliographic data.
2. Chemical registration file, which is used to registry those chemicals from plant, mineral, or other traditional drugs. Every chemical assigned a unique number (similar to CAS RN of the Chemical Abstracts Service). And can be crossed to patent bibliographic data.
3. TCM formula file includes all formulas indexed from patent documents, which can be crossed to patent bibliographic file to connect with related patents.

Other auxiliary files, such as subject terms (thesaurus), company code, legal status, and patent citations, are also used to support the database searching function and improve system recall and precision.

The database structure is shown in Fig. 1.

## 3. Database coverage

As noted in the introduction, the World Traditional Medicine Patent Database (WTMPD) covers more than 200 k natural/traditional medicine related basic patent records, more than 500 k patent family members, and about 200 k TCM formulas collected from 20+ countries and 2 international organizations from 1985 to current.

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<sup>1</sup> Editor's note: Other significant published work in this field of traditional medicines and knowledge are referenced as [4–9].

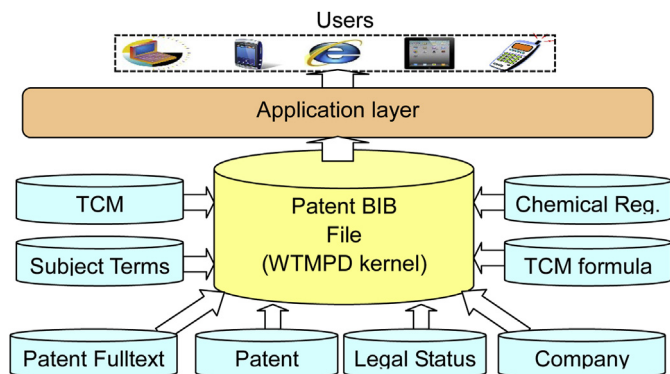


Fig. 1. WTMPD structure.

In order to achieve a high recall and precision, all data are deep indexed, including rewriting titles and abstracts, subject and therapeutic effect indexing, natural/traditional code indexing, TCM formula indexing, and company code indexing. Patent citations, legal status and patent fulltext data are also included.

#### 4. Key features

WTMPD has a number of professional features in order to achieve high recall and precision. Some key features are described in the following.

##### 4.1. Bibliographic data search

The Bib. data search interface for the WTMPD has such entries as title (TI), abstract (AB), application number (AP), publication number (PN), application date (AD), publication date (PD) and applicant (PA). Also it provides other entries which are not applicable to any non-indexed databases, including Index Term Code (ITC) and Therapeutic Effect (EFF). Entries to the Natural Medicine Registration File, the Compound Registration File, and the Formula File are also available. Each record has both bibliographic data and full-text/image available.

Two options are offered to access Bib. Data: simple search (Fig. 2) and advanced search (Fig. 3). With deep indexed data, special fields may be chosen to provide a search with more

precision. For example, “hypertension” may be entered together with limiting the search to the therapeutic use field. Another example would be to input “ginseng” and limit the search to the “processing” field. The fields of “subject” include combination, formulation, extraction, planting process, new therapeutic use, etc. The field of “Use” is indexed where specified in the claims and explicitly described in the specifications. It falls into the two categories: therapeutic effect and diagnosis, regarding the direct action of medicine on human body and diagnosis with diseases or relevant organs or viruses, respectively.

##### 4.2. Formula search

TCM or natural/traditional medicine formulas play an important role in the TCM or natural/traditional medicine search. The WTMPD collects formula information, including ingredients, mixing ratio and formula name. There are two options for searching TCM or natural/traditional medicine formulas: logical search and similarity search. Logical search (Fig. 4) provides users with ordinary logical operation searching. Formula similarity search (Fig. 5) is a more specialized professional search function. It can help a users find out those patent result which describe formulas containing some or all of the ingredients input as a search criterion. It would be too tedious to achieve this goal through conventional logical search. For instance, if a user is interested in a set of ten ingredients and wants to find out which patents mention formulas using at least seven of the ten ingredients as the ingredients at the same time, Formula Similarity Search can be used to get the results easily, without having to use 120+ logical searches. Therefore this feature greatly improves search efficiency. An example is shown in Fig. 6.

##### 4.3. Natural medicine search

Natural Medicine Registration File is an assistant tool for TCM patent search or TCM formula search. In this file, a record is created for every TCM, which includes TCM’s Latin drug name, English drug name, Latin plant/animal/mineral name, Chinese standard name, Chinese synonyms, and Chinese pinyin name. Users can find a specific TCM by any of these accesses, and then using standard Latin drug name (for English version) or Chinese standard names/Chinese synonyms (for Chinese version) to search BIB patent file or TCM formula file. The file crossover search function can be implemented by clicking the file crossover search button after selecting TCM names.

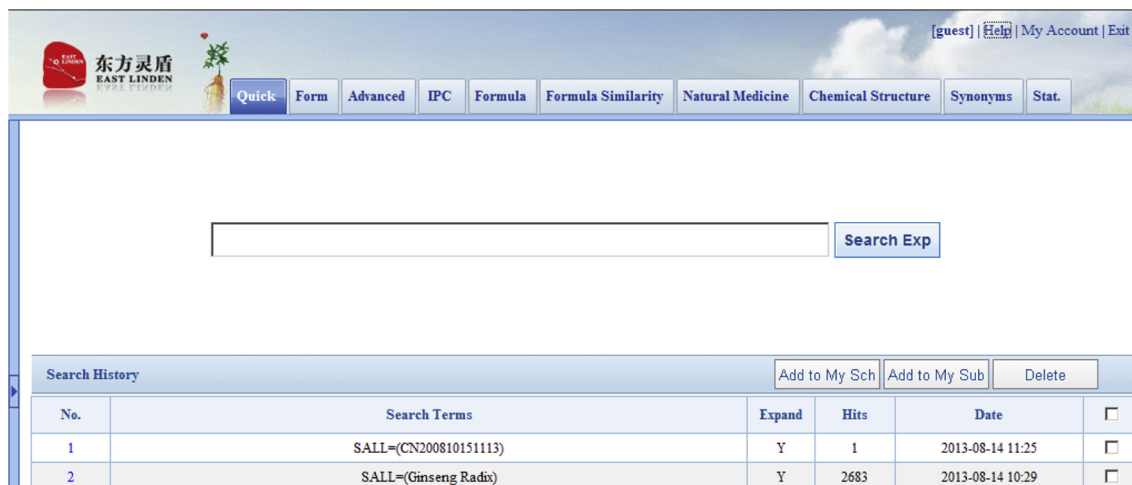


Fig. 2. Quick search.

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