

Traditional Knowledge Resource Classification (TKRC): Classification Methodologies of Traditional Knowledge



International Conference

**Utilization of the Traditional Knowledge Digital Library (TKDL) as a Model
for the Protection of Traditional Knowledge**

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Stages of Formal Acceptance of Traditional Knowledge Classifications

Feb 2001

India drives agenda on inclusion of traditional knowledge at International Patent Classification Union

Task force of five nations constituted by WIPO

Feb 2002

Task force recommends creation of subclass in A61 linking Traditional Knowledge Resource Classification developed by India with International Patent Classification

Materials from Plants

Stages of Formal Acceptance of Traditional Knowledge Classifications

Feb 2003

International Patent Classification Union adopted 200 subgroups for publication by July, 2005

Sub Groups

Accords formal recognition and acceptance of Traditional Knowledge as a distinct discipline at international level

Oct 2004

Deliberations on IPC-TKRC Concordance list of the new main group A61K 36/00

Approach adopted for inclusion of Organisms used in traditional medicine systems

- **Follow an authentic classification system**
- **Proceed from primitive to advanced at least at higher levels of classification**
- **Can be used comfortably by biologists, biochemists and classification experts at the IPC**
- **Will be a long term solution of incorporation of organisms with medicinal properties in the IPC**
- **Open for integration of organisms with medicinal properties belonging to different kingdom from other parts of the world used in TK**
- **Related bioactive constituents within families will exist together enabling an easier and effective search with respect to IPC**

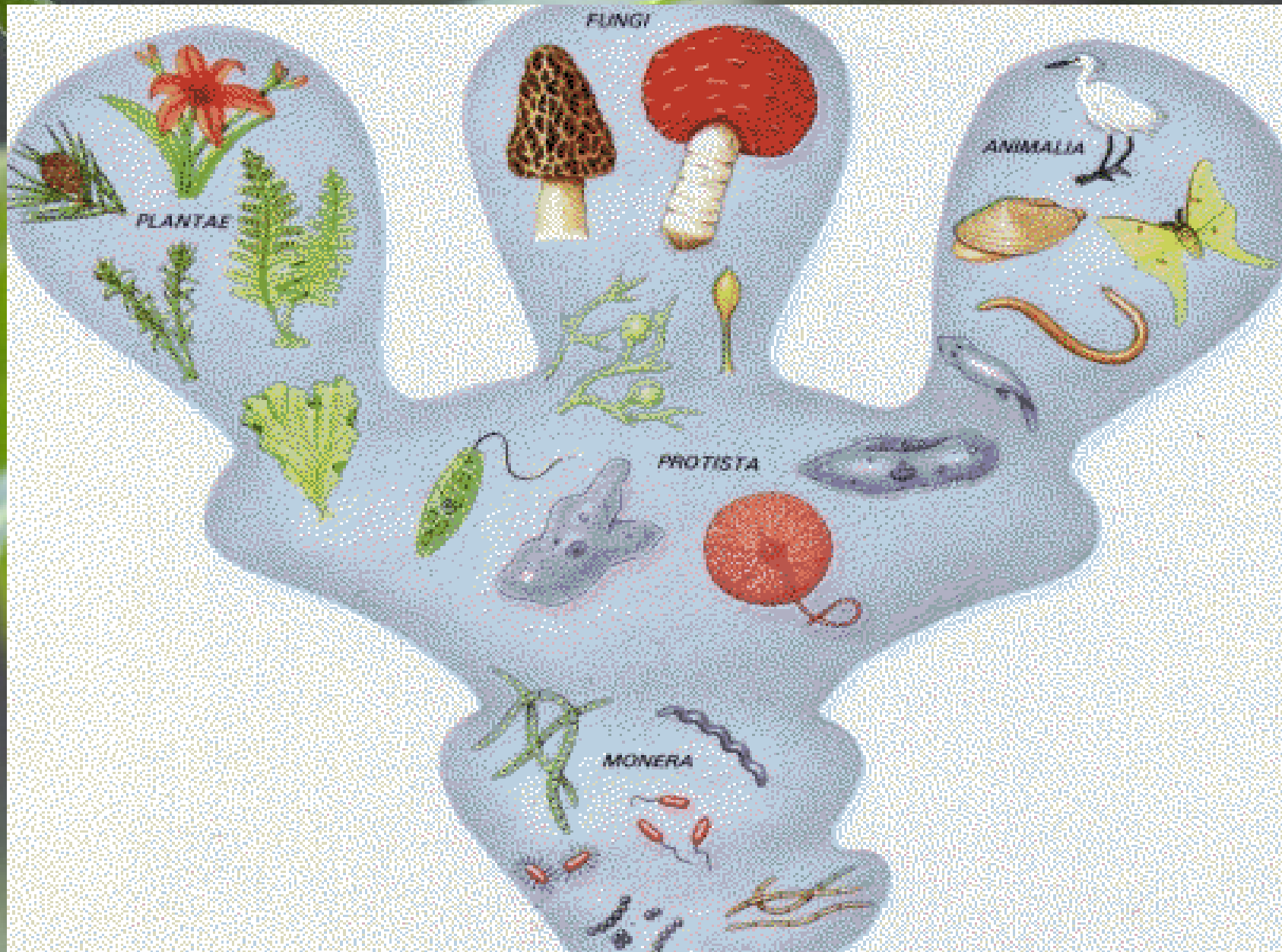
Linnaeus Two Kingdom Classification

- **Plantae**
 - Have cell wall, usually autotrophic, fixed to substratum
- **Animalia**
 - Lack cell wall, usually heterotrophic, mobile
- **Two kingdom classification insufficient to classify all biota**
 - **Bacteria and Cyanobacteria: prokaryotes**
 - **Protozoans: single celled and ingest food if not photosynthetic**
 - **Fungi: resemble plants as well as animals**

Whittaker's Five Kingdoms of Biota

- **Monera (10,000 species)**
 - prokaryotic cells; unicellular
 - Examples: bacteria , cyanobacteria
- **Protista (2,50,000 species)**
 - eukaryotic cells; unicellular
 - Example: protozoa
- **Fungi (1,00,000 species)**
 - eukaryotic cells; unicellular or multicellular
 - Examples: fungi, yeast, molds, mushrooms
- **Plantae (2,50,000 species)**
 - eukaryotic cells; multicellular; self-feeding
 - Examples: Flowering plants, Gymnosperms, Pteridophytes
- **Animalia (10,00,000 species)**
 - eukaryotic cells; multicellular; feed on other organisms
 - Examples: Mammals, Birds, Reptiles

Whittaker's Five Kingdom Classification



IPC Subgroups under Medicinal Preparations: 7th Edition

- **A61K 35/00: Medicinal preparations containing material or reaction products with undetermined constitution**
- **IPC classification**
 - **A61K 35/70: Lower fungi**
 - **35/72: Yeasts**
 - **35/78: Materials from plants (Advanced)**
 - **35/80: Algae (Primitive)**
 - **35/82: Lichens**
 - **35/84: Higher fungi**

Subgroup Categorisation A61K 36/00

S. No	IPC codes	IPC Categories	No. of Subgroups
1.	Algae	A61K 36/02 to 36/05	4
2.	Fungi & Lichens	A61K 36/06 to 36/09	10
3.	Bryophyta	A61K 36/10	1
	Pteridophytes	A61K 36/11 to 36/126	3
	Gymnosperms	A61K 36/13 to 36/17	5
	Angiosperms	A61K 36/18	1
	Dicotyledons	A61K 36/185 to 36/87	148
	Monocotyledons	A61K 36/88 to 36/9068	35
Total			207

Changes in the IPC 8th Edition

A61K36/00 Medicinal preparations of undetermined constitution containing materials from algae, lichens, fungi or plants or derivatives thereof eg., traditional herbal medicines

- **A61K 35/80 (Algae): Transferred to A61K 36/02 to 36/05 (Primitive)**
- **A61K 35/70 (Lower Fungi): Transferred to A61K 36/06**
- **A61K 35/72 (Yeasts): Transferred to A61K 36/064**
- **A61K 35/84 (Higher Fungi): Transferred to A61K 36/07**
- **A61K 35/82 (Lichens): Transferred to A61K 36/09**
- **A61K 35/78 (Materials from plants): Transferred to A61K 36/10 to 36/9068 (Advanced)**

Salient Features of IPC many based on the submission by TKDL

- **Kingdoms have been separated such as Algae, Fungi and Plantae as per phylogeny**
- **Angiosperms named Magnoliophyta, Dicotyledons Magnoliopsida, Monocotyledons Liliopsida**
- **Modern names of families adopted such as Apiaceae, Asteraceae, Brassicaceae, Lamiaceae, Arecaceae, Clusiaceae, also old family names given**
- **Families arranged alphabetically within each Kingdom for convenience of user**
- **Major families having large number of medicinal plants represented by genera, otherwise only up to family**
- **Genera within families also arranged alphabetically**
- **Well known common names also included since patent applications mention generic and/or common names**
- **Comprehensive and includes a wide variety of organisms which find application in traditional health care purposes**

Some bioactive alkaloids found in phylogenetically related species

┌ **IPC code C07D 451/10: Atropine, Scopolamine**

Family: Solanaceae (IPC code A61K 36/81)

- *Atropa belladonna*
- *Hyocyamus niger*
- *Datura*
- *Physochlaina*

Above plants closely placed in IPC subgroups of medicinal plants if classified according to family level classification as in revised IPC

┌ **IPC code C07D 455/03: Berberine**

Family: Berberidaceae (A61K 36/29)

- *Berberis*
- *Mahonia*

Related Bioactive Constituents in phylogenetically related Species

- IPC code: C07D 459/00: Reserpine lactone
 - Found in *Rauvolfia* (IPC code: A61K 36/24)
- IPC code: C07D 461/00: Vincamine
 - Found in *Vinca*, *Catharanthus* (IPC code: A61K 36/24)

All above plants rich in alkaloids having biological activity belong to the family Apocynaceae and placed under the same IPC code if classified according to family level classification as in revised IPC, alphabetical arrangement will separate them

Some more examples of Related Phytochemical Constituents

- Steroids (IPC code C07J)
 - Apocyanaceae (IPC code: A61K 36/24)
- Peptides (IPC code C07K)
 - Fabaceae (IPC code A61K 36/48)
 - *Lathyrus*
 - *Abrus*
 - *Vicia*
- Sugars (IPC code C07H)
 - Asteraceae (Inulin) (IPC code: A61K 36/28)

Concordance between IPC with TKRC wrt medicinal plants

- **TKRC has 30,000 subgroups whereas IPC has only 207 subgroups**
- **Concordance permits classification of the entire TM medicinal plants of the country under 207 subgroups of IPC enabling an efficient search by patent examiners**
- **Linking of traditional medicinal plants from other parts of the world practical**

Traditional Knowledge Resource Classification (Traditional Medicines)

- ▶ Medicinal preparations
- ▶ Drugs for disorder
- ▶ Anti-inflammatory, anti-parasitic agents

Concordance between A61K36/00 and TKRC

IPC code	Medicinal preparation of undetermined constituent	TKRC category	TKRC code
A61K36/04	..Rhodophyta (red algae, e.g. <i>Porphyra</i>)	<i>Gelidium amansii</i> Lam.	A01A 1/898
A61K36/126	... <i>Drynaria</i>	<i>Drynaria quercifolia</i> (L.) J. Sm.	A01A 1/728
A61K 36/16	.Ginkgophyta, eg. Ginkgoaceae (<i>Ginkgo</i> family)	<i>Ginkgo biloba</i> L.	A01A 1/909
A61K 36/17	..Ephedraceae (Mormon –tea family), eg. <i>Ephedra</i>)	<i>Ephedra gerardiana</i> Wall.	A01A 1/767

Concordance between IPC & TKRC - Medicinal plants

IPC Code	Category	TKRC category	TKRC code
A 61 K 36/232	<i>Angelica</i>	<i>Angelica archangelica</i> L.	A01A-1/172
		<i>Angelica glauca</i> Edgew.	A01A-1/173
A 61 K 36/233	<i>Bupleurum</i>	<i>Buplerum falcatum</i> L .	A01A-1/343
A 61K 36/235	<i>Foeniculum</i> (fennel)	<i>Foeniculum vulgare</i> Mill.	A01A-1/872
A 61K 36/264	<i>Aristolochia</i>	<i>Aristolochia indica</i> L.	A01A-1/206

1. A61K 36/00 is upto maximum of Genus level
2. TKRC is upto species level

Concordance between IPC & TKRC – Drugs for Disorders

S. No.	IPC	IPC Category	Description of TKRC	TKRC
1	A61P 15/00	Drugs for genital or sexual disorders	Uterine tumour / Pseudocyesis / Molar pregnancy	A01D-12/12
2	A61P 1/00	Drugs for disorders of the alimentary tract or the digestive system	Diseases of ano-rectum	A61D-17/04
3	A61P 11/00	Drugs for disorders of respiratory system	Bronchial asthma	A01D-11/18
4	A61P 25/00	Drugs for disorders of the nervous system	Epilepsy	A01D-8/05
5	A61P 17/00	Drugs for dermatological disorders	Ring worm	A01D-6/10

Concordance between IPC & TKRC

Anti-inflammatory & others

S. No.	IPC	Description of IPC	Description of TKRC	TKRC
1	A61P 29/00	Non-central Analgesics, antipyretic or antiinflammatory	Antipyretic	A01E-1/56
2	A61K 39/00	General protective or anti-noxious agents	Anti-poisons	A01E-1/165
3	A61P 29/00	Non-central Analgesics, antipyretic or antiinflammatory	Antiinflammatory	A01E- 1/123

Medicinal plants used in TM system which appear in patent applications

Botanical Name	US Patent Application No.	TKRC Code	IPC code
<i>Allium cepa</i>	20100178364	A01A-1/105	A 61 K 36/8962
<i>Camellia sinensis</i>	20100178364	A01A-1/371	A 61 K 36/82
<i>Cymbopogon citratus</i>	20100172847	A01A-1/622	A 61 K 36/899
<i>Carthamus tinctorius</i>	20100172847	A01A-1/404	A 61 K 36/286
<i>Terminalia chebula</i>	20100173022	A01A-1/1938	A 61 K 36/185
<i>Capsicum annum</i>	20100166895	A01A-1/391	A 61 K 36/81

Medicinal plants used in TM system which appear in patent applications

Botanical Name	EPO Patent Application No.	TKRC Code	IPC code
<i>Pistacia vera</i>	EP1520585	A01A-1/1496	A 61 K 36/185
<i>Cucumis melo</i>	EP1747786	A01A-1/588	A 61 K 36/42
<i>Andrographis paniculata</i>	EP1849473	A01A-1/165	A 61 K 36/19
<i>Cicer arietinum</i>	EP1889638	A01A-1/467	A 61 K 36/48
<i>Azadirachta indica</i>	EP1807098	A01A-1/265	A 61 K 36/58
<i>Curcuma longa</i>	EP2044850	A01A-1/603	A 61 K 36/9066

India's Earlier Proposal and Patent applications with respect to TK related subject matter

- **India proposed 2150 subgroups under medicinal plants to TK Task Force set up by the Committee of Experts in 2001**
- **Some members of the Task Force did not agree on 2150 subgroups**
- **Since additional subgroups involve cost and efforts on the part of examination**
- **Patenting activity on medicinal plants in the year 2000 was 4896**
- **Patents on IPCs related to TK such as Medicinal preparations of undetermined constitution, Therapeutics/ Chemical Compounds, metal, Carbocyclic compounds, macromolecules etc. have enhanced to 1,57,773**

Decision taken in the 35th IPC Union Meeting vis-à-vis Submission

- **“Committee agreed with the suggestion of the Task Force that a more detailed revision could be carried out at a later stage, in the course of next IPC revision period”**

(35th Session, IPC Union, October 2004)

- **Submission that since the patent activities have enhanced from what it was in 2001 when A61K 35/78 was being revised, it would be meaningful for Committee of Experts IPC Union of WIPO to consider enhancing from current 207 subgroups (A61K 36/00) to 2600 subgroups for medicinal plants used in Indian TM systems**
- **This is likely to enhance the quality and efficiency of search and examination by the patent examiners at the IPOs**



Thanks

Medicinal Preparations

S. No.	IPC Main Group	Description
1.	A61K 7/00	Cosmetics or similar toilet preparations
2.	A61K 9/00	Medicinal preparations characterized by special physical forms
3.	A61K 33/00	Medicinal preparations containing inorganic active ingredients
4.	A61K 35/00	Medicinal preparations containing material or reaction products thereof with undetermined constitution
5.	A61K 36/00	Medicinal preparations of undetermined constitution, products of medicinal plants



Drugs for Disorders

S. No.	IPC Main Group	Description
1.	A61P 1/00	Drugs for disorders of the alimentary tract or digestive system
2.	A61P 11/00	Drugs for disorders for the respiratory systems
3.	A61P 13/00	Drugs for disorders for the urinary system
4.	A61P 15/00	Drugs for genital or sexual disorders
5.	A61P 17/00	Drugs for dermatological disorders
6.	A61P 19/00	Drugs for skeletal disorders
7.	A61P 21/00	Drugs for disorders of the muscular or neuromuscular system
8.	A61P 25/00	Drugs for disorders of the nervous system
9.	A61P 27/00	Drugs for disorders of the senses
10.	A61P 37/00	Drugs for immunological or allergic disorders



Anti-Inflammatory and Others

S. No.	IPC Main Group	Description
1.	A61P 29/00	Non central Analgesic, antipyretic or anti-inflammatory agents
2.	A61P 31/00	Anti-infectives, ie., antibiotics, antiseptics, chemotherapeutics
3.	A61P 33/00	Anti-parasitic agents
4.	A61P 35/00	Anti-neoplastic agents
5.	A61P 39/00	General protective or anti-noxious agents
6.	A61P 41/00	Drugs for Surgical methods
7.	A61P 43/00	Drugs for specific purposes

