Summary

The tremendous progress made during the last five decades in research on life processes has begun to reveal molecular bases of human diseases. The genomics research is providing tools and techniques for discovering drugs for all kinds of diseases. It appears that the traditional knowledge on the use of plants for the treatment of diseases can help in the prospection of drugs from plants. In this process, the comparison of the medicinal plant inventories of different countries/continents can allow identification of plants which have been independently preferred for the medicinal use in geographically distant locations. The objective of the present investigation was to discover overlaps between the use of medicinal plant species in India and China and that in the countries of Africa, Europe, Americas and Australia and New Zealand.

The classical treatises, international journals and available directories were used to inventorize medicinal plants used in India, China and other south Asian countries (Asia), Africa, Europe and north America, Latin America and Australia and New Zealand, disease-or activity-wise. Since the Asian list was the biggest, shorter lists out of it were prepared of plants that are also used in countries of other continents. The listed medicinal plants species were examined in terms of their familial association(s), habit, plant part(s) used and method(s) of preparation of drug(s) from it/them. These lists were also compared with lists of plants related to allopathic and OTC herbal drugs already in the international market. India, China and other countries of Asia use 6013 plant species for medicinal purposes, 1311 for promoting digestion, 790 in nervous system disorders, 500-600 each for snake bite, fertility control and against skin and cardio-vascular afflictions, and 300-350 each against diabetes and for controlling musculo-skeletal deficiencies. Species in smaller numbers are used against worms, snake bites, cancers and AIDS, for dental hygiene, and in respiratory and nervous system disorders. About 18% of the species used in medications in Asia, also find use in Africa and Europe and north America (Europe). There are 353 plants that find use in Asia, Africa and Europe. Of these 29 species are also used in Latin America and 13 in Australia and New Zealand (Australia). These high degrees of overlaps over distant geographical areas, despite largely distinct florals of different continents, show that the medicinal properties of the concerned species must be very pronounced to have been discovered independently and should be targeted for drug discovery.

The overlaps are widespread among medicinal plant species used in different disease conditions or far distinct activities. Among the 583 species identified in Asia to be active in the treatment of cardiovascular diseases, 154 are used in Europe, 128 in Africa, 9 in Australia and 33 in Africa and Europe. In the case of 790 plant species identified to be active against nervous system disorders in Asia, 67 species find similar applications in Africa and Europe and 14 in Australia. In relation to 301 Asian diabetes related species, 45 are used in Africa and Europe, 6 in south America and 17 in Australia for controlling diabetes. In Asia 503 plant species serve as source of medicine in respiratory disorders. From among these 40 find use in Africa and Europe and 5 in Australia. Of the 339 medicinal plants used for relief from musculoskeletal injuries/deficiencies in Asia, 31 are similarly used in Europe and Africa, 10 in Australia and 6 in Latin America. Asians use
568 plant species for improving digestion. From among these medicinal plant species, 74
find use in Europe and Africa and only 9 in Australia. Of the 540 Asian skin care plant
species, 73 are so identified in and Europe and Africa, 20 in south America and 1 in
Australia. There is relatively more international correspondence also among the Asian
anti-worm and anti-snake bite plant species. Of the 590 species identified as anti-snake
bite in Asia, 53 have been so identified in Africa and Europe, 6 in Australia and 1 in
south America. Among the 162 anti-worm Asian medicinal plant species, 23 are common
with those in Africa and Europe, 8 in Latin America and 6 in Australia. Like-wise among
the 124 Asian antifertility plants, as many as 77 find similar use in Africa and Europe.
From among the 91 oral hygiene related plants of Asia, 14 are used in Africa, 11 in
Europe and 2 in Australia. Of the 93 Asian anti-HIV plant species, 6 are common to
Africa and Europe and 1 each to Australia and south America. In the case of anti-cancer
plant species, of the 164 Asian species, 33 find use in Europe, 26 in Africa, 18 in Africa
and Europe, 2 in Australia and 1 in Latin America.

The analyses on 6013 Asian medicinal plant species showed that although these
belonged to 187 families on the whole, a large number of species belonged to Asteraceae,
Fabaceae, Euphorbiaceae, Lamiaeae, Cucurbitaceae, Apiaceae, Apocynaceae, Liliaceae
and Poaceae. Asian medicinal plant species that found use in (a) Australia, (b) Africa and
(c) Europe belonged preferentially to (a) Amaranthaceae, Asteraceae, Euphorbiaceae,
Fabaceae, Moraceae and Myrtaceae, (b) Capparidaceae, Convolvulaceae, Lauraceae,
Rutaceae, Solanaceae and Verbenaceae and (c) Convolvulaceae, Moraceae and
Verbenaceae, respectively. It is also observed that often the same plant species finds use
in the treatment of several diseases and that more than one species of the same genus has
been in use in the traditional medicine for the same purpose.

The following genera are represented by more than 10 species among the traditional
medicinal plants: Aloe, Amaranthus, Annona, Acacia, Achillea, Aconitum, Albizia,
Allium, Arisaema, Aristolochia, Artemisia, Astragalus, Bauhinia, Berberis, Bidens,
Blumea, Brassica, Caesalpinia, Cyperus, Clerodendrum, Commiphora, Cordia,
Crotalaria, Croton, Cymbopogon, Capparis, Cassia, Cinnamomum, Citrus, Cleome,
Garcinia, Desmodium, Dioscorea, Diospyros, Ephedra, Eucalyptus, Eupatorium,
Euphorbia, Erythrina, Ferula, Ficus, Juniperus, Mentha, Millettia, Morinda, Nicotiana,
Ocimum, Panax, Phaseolus, Phyllanthus, Pinus, Panicum, Passiflora, Piper, Plantago,
Polygala, Polygonum, Prunus, Rauwolfia, Rhus, Rosa, Rubus, Salvia, Senecio, Smilax,
Solanum, Strychnos, Swertia, Tephrosia, Terminalia, Teucrium, Thymus, Trichosanthes,
Vernonia, Vitex, Zanthoxylum, Ziziphus. Habit-wise the traditional medicinal plant
species are 2592 herbs, 1489 trees, 1496 shrubs and 436 climbers. However, among them
these is preference for (a) herbaceous and shrubby species in Africa and Europe, (b)
herbaceous and tree species in Australia and (c) herbaceous, tree and shrubby species in
Latin America.

Preferred plant organs for medicine preparation among the 6013 Asian medicinal species
are whole plant (1290 species), whole root (1549 species), whole leaves (1516 species)
and whole fruits (1236 species), as one or more plant organs may be used in the product.
In Africa, Europe and north America roughly same plant organs are used in preparation
of medicine from Asian medicinal plants as employed in Asia. However, seeds and whole plants find preference in South America and leaves and whole plants in Australia and New Zealand. Root bark which is used for 42 Asian medicinal plant species does not find use in south America and Australia, New Zealand. Likewise, latex which finds use for 74 species in Asia is not in use in Australia and New Zealand.

Asian medicinal plants are processed to obtain extracts, decoctions, infusions, juices or pulp (5169 species), poultices and pastes (347 species), powders (330 species), oils (150 species) and latex, gums and resins (74 species). This same pattern of use is prevalent in Africa, Europe and north America, except that gums, resins and powders find some degree of preferential use in Africa and juices in Europe and north America. The powders, juices and poultices and pastes are favored in south America and decoction and extracts in Australia.

Briefly the present work has identified medicinal plant species and their organs that are used for similar disease conditions in countries of different continents. Pursuance of their prospection may help in discovering of dependable herbal and allopathic drugs.