

II : BIOLOGICAL SCREENING

N.K.B. Adikaram

Biological screening is an essential component of a scientific investigation of medicinal plants and this allows initial detection of the biologically active principle as well as its step wise monitoring during the process of extraction and purification. In every biological screening test, a living organism is used; the test plant material, its extract or purified component is introduced or exposed to the organism and after a period of incubation the response of the organism is determined. This is generally referred to as 'bio-assay' and has now become a very useful tool in the detection and isolation of naturally occurring bio-active compounds. A wide range of bio-assay techniques are now available to evaluate such properties as antimicrobial, antifungal, insecticidal, insect-antifeedent activity and fertility regulation etc., in plants. An example for such bio-assay test is briefly outlined below:

Bio-assay for antifungal compounds:

Widely used tests are Thin Layer Chromatographic bio-assay, spore germination and agar plate method.

Thin Layer Chromatographic (TLC) bio-assay:

Crude extracts or pure compounds are chromatographed on TLC plates and after air drying, the plates are sprayed with a suspension of spores of a fungus in a nutrient medium usually in Czapek-Dox medium (2g NaNO<sub>3</sub>,

1g KH<sub>2</sub>PO<sub>4</sub>, 0.5g MgSO<sub>4</sub>·7H<sub>2</sub>O), 0.5g FeSO<sub>4</sub>, 0.5g KCl, 30g sucrose in 1000ml distilled water and the solution is autoclaved for 15 min. at 15 lb and 121 C. After incubation for 36-48 h in a moist chamber the plates are examined for inhibition areas.

APPENDIX - 1

SOME COMMONLY USED MEDICINAL PLANTS OF SRI LANKA

Botanical name (Family)	Sinhala/Tamil/English name	Important uses
1. <u>Abrus precatorius</u> (Leguminosae)	S - Olinda T - Kundumani E - Indian Liquorice	Sore throat Conjunctivitis ulcers
2. <u>Acalypha indica</u> (Euphoribaceae)	S - Kuppameniya T - Kuppaimeni E - Three seeded mercury	Anthelmintic, bronchitis, asthma, ringworm
3. <u>Acorus calamus</u> (Araceae)	S - Wadakaha T - Vashambu/Vasambu E - Cinnamon Sedge	Cough, fever, anthelmintic
4. <u>Aerva lanata</u> (Amaranthaceae)	S - Polpala T - Sirupoolai Thenkapoo-Keerai E - -	Diuretic, coughs, headaches
5. <u>Allium sativum</u> (Amaryllidaceae)	S - Sudu lunu T - Vellaipoodu E - Garlic	Anthelmintic, diuretic, asthma, high blood pressure, gastric stimulant, bronchitis
6. <u>Aloe vera</u> (Liliaceae)	S - Komarika T - Kattalai E - Aloe	Asthma, burns, dyspepsia
7. <u>Asparagus racemosus</u> (Liliaceae)	S - Hathawariya T - Sathavari E - -	Jaundice, diuretic gonorrhoea
8. <u>Azadirachta indica</u> (Meliaceae)	S - Kohomba T - Vembu E - Margosa tree	Carminative, smallpox Anthelmintic, Chronic ulcers, sores, Rheumatism

9. <u>Bacopa monniera</u> (Scrophulariaceae)	S - Lunuwila T - Brami E - -	Epilepsy, diuretic, Snake bites
10. <u>Bryophyllum pinnatum</u> (Crassulaceae)	S - Akka-pana T - Malai Kalli E - -	Urinary disorders Paultice
11. <u>Calotropis gigantea</u> (Asclepiadaceae)	S - Wara T - Errukkalai E - Giant milk weed	Tumour inhibiting, Cough, cold, asthma, loss of appetite
12. <u>Cannabis sativa</u> (Canabidaceae)	S - Ganja T - Ganja E - Cannabis	Dysentery, tetanus, headache, appetizer
13. <u>Carica papays</u> (Caricaceae)	S - Gas-labu T - Pappali E - Papaya	Dyspepsia, intestinal irritation, ulcers
14. <u>Cassia auriculata</u> (Leguminosae)	S - Ranawara T - Ponnāvarmasu E - Tannor's cassia	Diabetes, laxative, eye diseases
15. <u>Centella asiatica</u> (Umbelliferae)	S - Gotukola T - Vallara E - Water Navel	Indigestion, dysentery, Eczema
16. <u>Chenopodium ambrosioides</u> (Chenopodiaceae)	S - Chenopodium T - Sinnapodium E - Worm seed	Anthelmintic, Vermifuge
17. <u>Coleus malabaricus</u> (Labiatae)	S - Eriwaria T - - E - -	Stomach ailments
18. <u>Coscinium fenestratum</u> (Menispermaceae)	S - Weni-wal T - Maramanchal E - Calumba Wood	Antiseptic, tetanus
19. <u>Crotalaria verrucosa</u> (Leguminosae)	S - Nil-andanahiriya T - Kilukiluppai E - Blue rattle-pod	Scabies, impetigo
20. <u>Croton tiglium</u> (Euphorbiaceae)	S - Jayapala T - Naganam E - Purging Croton	Purgative, cancer, rheumatism

21. <u>Curcuma longa</u> (Zingiberaceae)	S - Kaha T - Manjal E - Turmeric	Bruises, dysentery, anthelmintic
22. <u>Cyperus rotundus</u> (Cyperaceae)	S - Kalanduru T - Korai E - Nut sedge	Antiseptic, dysentery, diuretic
23. <u>Datura metel</u> (Solanaceae)	S - Kalu-attana T - Oomattai E - Purple Datura	Narcotic, asthma
24. <u>Ervatamia divaricata</u> (Apocynaceae)	S - Watu-sudda T - Nandiyar-vattam E - Moon flower	Sore eyes, Inflammation of the cornea
25. <u>Gloriosa superba</u> (Liliaceae)	S - Niyangala T - Karthikaipoo E - Glory lilly	Bruises, sprains, Leprosy
26. <u>Hemidesmus indicus</u> (Asclepiadaceae)	S - Iramusu T - Nannari E - Indian Sarsaparilla	Diuretic, fever
27. <u>Ixora coccinea</u> (Rubiaceae)	S - Rat mal T - Vedchi E - Red ixora	Dusentery, Sedative, Bronchitis
28. <u>Mesua ferrea</u> (Guttiferae)	S - Na T - Nagamaram E - Iron Wood	Astringent, stomachic dysentery, vomiting coughs
29. <u>Michelia champaca</u> (Magnoliaceae)	S - Sapu T - Champakam E - Golden champa	Carminative, stimulant, antispasmodic, diuretic stomachic
30. <u>Mimosa pudica</u> (Leguminosae)	S - Nidi kumba T - Thottasuringi E - Humble plant	Kidney diseases, brochitis
31. <u>Momordia charantia</u> (Cucurbitaceae)	S - Karawila T - Pakal E - Bitter gourd	Diabetes, dysentery, vermifuge
32. <u>Moringa oleifera</u> (Noringaceae)	S - Murunga T - Murungai E - Drumstick	Aphrodisiac, diurectic, digestive, authelminitic

33. <u>Murraya koenigii</u> (Rutaceae)	S - Karapincha T - Karuvembu E - Curry leaf	Diarrhoea, dysentery
34. <u>Nelumbium speciosum</u> (Nymphaeaceae)	S - Nelum T - Thamarai E - Lotus	Diuretic, cardiac tonic, diarrhoea
35. <u>Ocimum sanctum</u> (Labiatae)	S - Madurutala T - Thulasi E - Basie	Gonorrhoea, malaria, catarrh
36. <u>Pavetta indica</u> (Rubiaceae)	S - Pavatta T - Pavattai E - Indian pellet shrub	Haemorrhoids Rheumatism, visceral obstruction
37. <u>Piper betle</u> (Piperaceae)	S - Bulath T - Vettilai E - Betel	Antiseptic, febrifuge, small pox
38. <u>Piper longum</u> (Piperaceae)	S - Thippili T - Thippili E - Long pepper	Fever, cough, bronchitis
39. <u>Plumbago zeylanica</u> (Plumbaginaceae)	S - Ela-nitul T - Akkini E - Ceylon Leadwort	Dyspepsia, diarrhoea
40. <u>Punica granatum</u> (Punicaceae)	S - Delum T - Mathulai E - Pomegranate	Astringent, diarrhoea, dysentery, bronchitis
41. <u>Rauvolfia serpentina</u> (Apocynaceae)	S - Ekaweriya T - Sorannamilbori E - Snake root	Anthelmintic, blood pressure, insanity
42. <u>Ruta graveolens</u> (Rutaceae)	S - Arudha T - Arudha E - Garden rue	Bronchitis, pneumonia
43. <u>Sesamum indicum</u> (Pedaliaceae)	S - Thala T - Ellu E - Sesame	Vermifuge, catarrh
44. <u>Sida acuta</u> (Malvaceae)	S - Gas-bevila T - Chittamatti E - -	Haemorrhoids, fever

45. <u>Solanum jaquini</u> (Solanaceae)	S - Katuwelbatu T - Sutturam E - -	Coughs, asthma
46. <u>Tinospora cordifolia</u> (Menispermaceae)	S - Rasakinda T - Chintil E - -	Stomachache, fever
47. <u>Vernonia cinerea</u> (Compositae)	S - Monara kudumbiya T - Seedevar senkalanir E - -	Anti-rheumatic, conjunctivities, wormifuge
48. <u>Vetiveria zizanioides</u> (Graminae)	S - Savandara T - Vettiver E - Khus-Khus	Typhoid fever, anaemia, oedema
49. <u>Vitex trifolia</u> (Verbenaceae)	S - Nika T - Nochi E - -	Sprains, rheumatism
50. <u>Zingiber officinale</u> (Zingiberaceae)	S - Inguru T - Ingi E - Ginger	Dyspepsia, colds, fever

APPENDIX - II

GLOSSARY OF MEDICAL TERMS

ABSCISS .....	A collection of pus or matter in any internal or external part of the body.
ANTHELMINTIC .....	A drug that is capable of killing intestinal worms. vermifuge.
ANTACID .....	A drug which neutralises the acidity of the gastric juice.
ANAEMIA .....	A disease in which the blood is deficient in quantity or in red blood cells.
ASTRINGENT .....	A drug which induces contraction of tissues, or arrests secretion or bleeding.
ANTICEPTIC .....	A drug which destroys disease germs.
COLIC .....	Pain due to spasmodic contraction of the abdomen.
CANCER .....	Any malignant growth.
CONJUNCTIVITIS.....	Inflamation of the conjunctiva or the mucous membrane covering the eye ball.
CARMINATIVE .....	A drug which relieves flatulence or the feeling of over fulness of the stomach
DIURETIC .....	A drug which increases the amount of urine.
DROPSY .....	A disease marked by an excessive collection of a watery fluid in tissues.
LAXATIVE .....	Relieves pain. Taken off the stress and strain.
ECZEMA .....	A skin disease.
EMETIC .....	A drug which causes vomitting.
FEBRIFUGE .....	A drug used for reducing fever.
GALLACTAGOGE .....	An agent that promotes the secretion and flow of milk.
LEPROSY .....	A chronic wasting disease caused by a germ.
NARCOTIC .....	A drug which induces deep sleep.
OPHTHALMIA .....	Inflamation of the eye.
STYPTIC .....	An agent which checks bleeding.