SUMMARY

This investigation was carried out to study the antimicrobial activity of certain plant oils and extracts against many test organisms. The study included three parts.

Part one: Studying the antimicrobial activity of 25 plants oils and extracts against different test organisms by the agar diffusion method.

Part two: Effect of some plant oils on reducing the microbial counts of some test organisms as estimated by the plate count method.

Part three: Effect of some plant extracts and drinks,normally taken orally, on reducing the natural flora of the human intestine.

The following results were obtained:

E.coli was sensitive to the different concentration of the following oils, which could be arranged descendingly according to their effectiveness as follows: aniseed oil, thyme oil, clove oil, jasmine oil, marjoram oil and pine oil.

Klebsiella aerogenes was sensitive to the oils chamomile,

pelargonium, thyme,clove,caraway, gernium, marjoram, cumin and pine (in a descending order).

Klebsiella pneumonia was sensitive to the oils: thyme, fennel, pine, cumin, caraway, clove and marjoram (in a descending order).

Pseudomonas aeruginosa was sensitive to the oils: caraway, coriander, dill, thyme, fennel, aniseed, marjoram, cumin, geranium, spearmint, rose, lemongrass, basil, pine, clove and jasmine.

Pseudomonas fluorescens showed sensitivity to the oils: geranium, thyme and spearmint as well as carway oil and aniseed oil.

Salmonella typhimurium was sensitive to the oils: jasmine, clove, thyme, cumin and marjoram (in a descending order).

Streptococcus sp. was sensitive to the oils: thyme, marjoram, dill, jasmine, fennel, clove, basil, pine, caraway and celery (in a descending order).

Staphylococcus aureus was sensitive to the oils chamomile, geranium, pelargonium, celery, fennel, spearmint, thyme, basil, caraway, clove, marjoram, pine, peppermint and jasmine (in a descending order).

Staphylococcus aureus A was sensitive to the oils: dill, pine, celery, cumin , peppermint, lemongrass, clove and caraway (in a descending order).

Staphylococcus aureus B was sensitive to the oils: geranium, dill, clove, marjoram, pelargonium, cumin and fennel (in a descending order).

Micrococcus luteus was sensitive to the oils: pelargonium, dill, caraway, peppermint, thyme, marjoram, clove, basil, chamomile, cumin and spearmint (in a descending order).

Bacillus cereus was sensitive to the oils: dill, chamomile, cumin, caraway, basil, thyme, pelargonium, geranium, pine, rose, marjoram, peppermint, spearmint, jasmine, clove, celery and lemongrass (in a descending order).

Candida albicans was sensitive to the oils: aniseed, celery, chamomile, rose, cumin, clove, jasmine, geranium, marjoram, pine, caraway, thyme, spearmint and fennel (in a descending order).

Saccharomyces cerevisiae was sensitive to the oils: caraway, chamomile, pine, celery, dill, fennel, pelargonium, marjoram, spearmint, clove, lemongrass and peppermint. (in a descending order).

Concerning the effect of plant oils and extracts on the investigated fungi, it was found that disks immersed with the crude oils and added to petri-dishes inoculated with the studied fungi completely inhibited the growth of these fungi. Concentrations equal to or less than 10% of rose oil, thyme, geranium, castor, coriander, aniseed, jasmine, spearmint, marjoram, carway, ether extract of onion, drosera extract, saliva extract, fennel and dill oils; showed no effect on the examined fungal species.

Some oils as basil, lemongrass, chamomile, clove, cumin, celery, peppermint and pelargonium showed moderate effects against different fungal species. Nevertheless, Fusarium oxysporum completely resisted all the tested oils except clove which showed active anti-microbial action against this species.

Aspergillus niger tolerated all the tested oils except celery oil which at concentrations 10^{-1} and 10^{2} stopped fungal sporulation up to the five days of incubation.

Results also showed the inhibitory effects of active oils at very low concentrations, except in case of celery oil which was greatly tolerated by most tested species.

During the aforementioned study of the effect of plant oils and extracts against the bacteria and fungi as test organisms, a general trend was observed which indicated that

- arranged descendingly according to their sensitivities: (A) Salm. typhimurium, (B) C.albicans, Kl.aerogenes, (C) Staph. aureus, (D) E.coli and (E) M.luteus.

- The descending arrangement of the organisms sensitivities towards jasmine oil was: (A) Salm.typhimurium, (B) Kl.aerogenes, (C) M.luteus, E.coli and (D) Staph. aureus.

This part of the study indicated that different organisms varied in their sensitivities towards the same oil, and different oils varied in their effectiveness towards the same test organism.

Part three: The effect of some popular drinks such as roselle, fenugreek, carway, aqua cinnamomi and some seasoning materials as garlic juice, cumin,pepper as well as aqua aurantifloris and aqua rosae on the intestinal flora were added to the aforementioned extracts for 15 min., 60 min., 6 hours and 24 hours. Then surviving organisms were estimated by the plate count method. The following results were obtained:

- The study showed the highly drastic effects of the tested materials against the intestinal flora within fifteen minutes of mixing.

- After one hour of mixing, the faecal flora with the aforementioned extracts (drinks), the percentages of reduction in microbial counts were more than 97%.

- After 6 hrs. of mixing the faecal materials with the plant extracts, mostly 99% of the faecal organisms were removed.

- After 24 hrs. of mixing, it was found that two different effects were obtained:

  a- The extracts of the popular drinks which included carway, fenugreek, roselle and aqua cinnamomi continued their inhibitory action against the surviving organisms.

  b- The extracts of seasoning materials as garlic, pepper, aqua rosae and aqua aurantifloris caused adaptation to the surviving faecal organisms which began to increase in counts after 24 hrs. contact with these extracts.

The author recommends that further studies must be carried out which include the germicidal effect of all Egyptial medicinal plants in vitro and in vivo. Such studies will be of great value in medical and phytopathological applications.