A COMPARATIVE PHARMACOGNOSTIC STUDY OF SRI LANKAN MAIDEN HAIR FERN (ADIANTUM) WITH PERSIAUSHAN (ADIANTUM CAPILLUS VENERIS . L)

THESE IS SUBMITTED FOR THE DEGREE OF MASTER OF PHILOSOPHY (UNANI)

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SUMMARY
GENERAL CHARACTERS OF THE FERNS

1. Belongs to Pteridophyta or vascular cryptogems.
2. Many are shade and moisture loving plants.
3. In many common ferns the stem is relatively insignificant.
4. Usually deeply divided, pinnate fronds.
5. All the roots of the adult ferns are adventitious. They usually arise in the neighbourhood of the leaf bases and are generally black in colour.
6. The young leaf is commonly more or less densely clothed with brown scaly hairs or Ramenta. The axis of the lamina becomes coiled after the manner of a watch spring - and in compound leaves the individual portions become in rolled in a similar way.
7. The venation is exceedingly characteristic, the midribs of the leaves or pinnae as the case may be bearing numerous forked lateral veins which are often not connected by cross branches.
8. A leaf bearing sporangia is called a Sporophyll. In most ferns the sporophylls are leaves which function both as vegetative and reproductive organs.
9. There is never a specialised reproductive shoot distinct from the ordinary vegetative one.
10. Sporangias are developed immediately over the veins. They are protected by a horse shaped scale called the Indusium.

Comparison of Identification Characters

	Adiantum capillus veneris	Adiantum consinum	Adiantum radianum
Rhizome	Slender much branch and thick	Less branch	Very much less
Leaves	15-30 c.m. - long 08 - 14 c.m. - wide	Relatively large	Smaller than other two
Pinnules	1 - 2.5 c.m. long 1 - 3.0 c.m. wide Deeply lobate Lobes finely toothed	Relatively larger Not deeply lobate	0.5 1 cm. - very small Not deeply lobate
Veins	Entered into tooth	Entered into sinusses	Entered into sinusses
Sori	Round or orbicular	Oblong	Lunicate
Sporangium	Small, globular	Comparatively large	Short Stalk
Merystals	Dicto style arrangement 3-5 Vascula bundles	Gutter shape Vascular bundle Protostyle	Gutter Shape 2-3 Vascular bundles

Identification characters of Adiantum Capillas Veneris

1. Rhizome slender much branch and thick.
2. Leaves 15 - 30 c.m. long
   8 - 14 c.m. wide
3. 2 - 3 Pinnate. Pinnate distant, not overlapping.
4. Pinnules - 1 - 2.5 cm. Long
   1 - 3 cm. Wide
5. Pinnules deeply lobate, lobes finely tooth.
6. Veins entered in to tooth, not in the sinusses.
7. Dicto style arrangement of merystals.
8. Sporangium - small, globular, stalk 2 - 3 celled row.
9. Sori - round or orbicular in shape.
10. Annuler cells 18 - 20 in number.
11. Spores - fine smooth - yellow in colour.
    45 - 60 m.m. in size.

Identification characters of Adiantum Consinum

1. Rhizome Less Branch.
2. Leaves relatively larger in size.
3. Pinnules not deeply cobate.
4. Veins run into sinusses not into the tooth.
5. Stalks of the leaves short. So the inner and upper leaflet overlies the main Rachis.
6. Arrangement of Merystal - Protostyle.
7. Oblong, Sori.
8. Sporangum - Comparatively large.

Annexe - 9 – 12

Identification characters of Adiantum Radianum

1. Rizome - very much less than other two varieties.
2. Leaves are smaller than the other two varieties.
3. Pinnules - 0.5 - 1 cm. in size - very small
4. Fronds - Tri Pinnate or Quadri Pinnate
5. Main Rachis short, creeping, stipes, clustered.
6. Pinnules with Cuneate bases.
7. Sori - lunicate.
8. Sporangium short stalk - with these specific features I could identify the specific varieties related to my study.

Annexe - 13- 16

Preliminary Chemical Study - under this Capillas Venris, Adiantum Consinum , Adiantum Radianum were subjected to

A. Loss on Drying .
   Fresh / Dried sample.

B. Ash values
   Total ash
   water soluable ash
   Water insoluable ash

C. Extractive values

D. Chromatographic Separation

E. Qualitative Analysis for

   I Alkaloids
   II. Glycosides
   III. Proteins
   IV. Steroles / Terpenes
   V. Tannins
   VI. Test for reducing and non reducing sugar were carried out.

Comparatively test results were as follows:

Loss on drying fresh / dried samples.

	A. CAPILLAS VENERIS	A. CONSINUM	A. RADIANUM
LEAVES	64.29% * 28.27%	75.07% * 31.43%	71.00% *40.00%
RACHIS	56.39% * 11.50%	58.48% * 10.22%	58.41% * 20.10%
ROOTS & STEM	77.51% *50.12%	57.37% * 23.32%	53.19% * 30.03%

* **Dried sample.**

EXTRACTIVE VALUES

Percentage of extractive values compared as follows:

C. VENERIS	CHLOROFORM	PET ETHER	ALCOHOL	WATER
LEAVES	1% / 2% / 4%	2% / 1% / 2%	4.5% / 3.5% / 5%	4.5% / 5.5% / 4.5%
RACHIS	1% / 1% / 2%	0.00% / 0.00% / 0.00%	1% / 2% / 5%	4% / 3% / 5%
STEM & ROOT	1% / 1% / 2%	0.00% / 0.00% / 0.00%	1% / 1% / 2%	2% / 1% / 2.5%

Ash values were compared as follows:

	A. CAPILLAS VENERIS	A. CONSINUM	A. RADIANUM	
LEAVES	17.58%	10.49%	9.13%	TOTAL
	9.84%	8.42%	8.44%	WATER SOLUABLE
	7.73%	2.06%	1.02%	INSO LUABLE
RACHIS	16.86%	9.28%	10.82%	TOTAL
	14.73%	8.18%	8.30%	SOLUABLE
	2.13%	1.10%	2.51%	INSO LUABLE
STEM & ROOT	18.11%	16.04%	17.09%	TOTAL
	17.27%	15.50%	16.62%	SOLUABLE
	0.83%	0.53%	0.46%	INSO LUABLE

Thin layer chromatogram

Silica-gel 60 - Used as a solid phase. Several solvent system were tried at B. M. A. R. I. Laboratory and in the Research Unit of I.I.M.

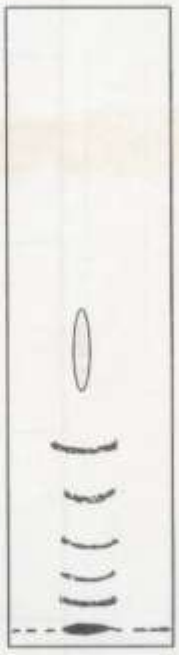
Successful chromatogram was obtain in

Pet ether	:	Di-ethyl-ether	:	Acetic acid
80%		20%		0.25%

Separated bands were noted as follows:

A. C. Veneris

A. Consinum



A. Radianum

QUALITATIVE ANALYSIS

Test results were comparatively shows similar type of reaction.

TEST FOR	ALCOLOIDS	GLYCOSIDS	PROTEINS	TANINS	STEROLS TERPENE	REDUCING SUGAR NON-REDUCING SUGAR
A. CAPILAS VENERIS	+	+	+	+	+	+
A. CONSINUM	+	+	+	+	+	+
A.RADIANUM	+	+	+	+	+	+

If I compare all these test results I could be able to strongly suggest that the freely growing Sri Lankan Maiden Hair Fern (Adiantum Consinum and Adiantum Radianum) as a genuine substitutes in place of Adiantum Capilas Veneris - Linn which is a rare variety in Sri Lanka.