

**Short Communication**

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**A STUDY OF SILAJIT FROM PAKISTAN**

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Silajit is a recognized drug in Unani and Ayurvedic medicine. A genuine sample was collected from Chitral (Pakistan) and each portion of the sample of Silajit was observed by stereoscopic microscopy at magnifications up to 80x. Whole pieces of the sample were amber and appeared to be fused material. Many holes were present which may have been formed when the material was viscid and appeared to be the result of broken bubbles. Cracks were present within which there were crystals of two types, namely, (1) clear and transparent and (2) yellow to amber. The colourless transparent crystals lined some of the indentations in the sample. Needlelike pale yellow to amber crystals protruded from some of the cracks. In some areas the yellow crystals had a cloth like appearance and were present in overlapping striated layers. In one portion of the sample, a black striated area was observed.

A portion of the Silajit was dissolved in warm water and the insoluble material was examined also by stereoscopic microscopy. This insoluble portion consisted of clear transparent crystals and yellow to amber crystals identical with those observed in the cracks and indentations of whole samples. Small particles of debris, possibly broken crystals were observed. Such debris is not believed to be particles of clay.

Portions of the samples were also examined by incident light microscopy at magnifications up to 220x. The observations were essentially the same as those recorded by stereoscopic microscopy, however, higher magnifications (110x and 220x) some clusters of spheres, possibly pollen were observed.

**Elementary analysis.**

Total elements	Water-soluble (40 %)	Water-insoluble (60 %)
C (Organic)	43.9	23.2
C (Carbonate)	1.5	4.4
H	6.0	
O	37.1	

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N (Kjeldahl)	2.8	
N (Dumas)	2.9	
N (Van Slyke*)	2.9	
S	0.24	
Ash	11	53

\*Hydrolysed sample

**Ammonia-amino acid-carbohydrate analyses**

*Water-insoluble fraction.* Values are based on the dry weight of the total water-soluble material which was obtained by extraction and freeze drying.

Carbohydrate (calculated as glucose) 4.9, 5.0 %

*Water-soluble fraction (Before hydrolysis).* Small amount of ammonia and trace amounts of serine and glycine.

**After hydrolysis.**

Components	Percent	Nitrogen only (%)
Ammonia	1.46	1.20
Alanine	0.08	0.013
Arginine	Trace	
Aspartic acid	0.33	0.035
Cystine (half)	Trace	
Galactosamine	Trace	
Glucosamine	Trace	
Glutamic acid	0.47	0.045
glycine	8.25	1.54
Histidine	Trace	
Isoleucine	Trace	
Leucine	Trace	
Hysine or Ornithine	Trace	
Methionine	Trace	
Phenylalanine	Trace	
Proline	0.10	0.012
Serine	0.10	0.013
Threonine	0.13	0.015
Tyrosine	Trace	
Valine	0.13	0.016

(Continued.....)

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(Continued)

Carbohydrate 5.5  
(calculated as glucose)

	16.6
	2.89

It will note that all the nitrogen has been identified but that a large amount of the carbon, hydrogen and oxygen and the small amount of sulfur have not. It should be noted further that most of the ammonia and the amino acids are combined, but are liberated on hydrolysis. Assuming that combination is through an amide link, the empirical formula of the unidentified portion is  $CH_{1.4} O_{0.6}$ .

If it is assumed that the glycine is combined as hippuric acid, about 32 % of the organic carbon in this fraction becomes identified and the empirical formula of the remaining 68 %,  $CH_{1.64} O_{0.69}$ .

In respect of the ammonia we suspect but have not as yet proved that it is combined as urea.

The nitrogen-free portion has been separated and is strongly acidic. Separation of sufficiently large amount for fractionation and possible identification of individual compounds will be carried out as time permits.

**Key words:** Silajit, Unani and Ayurvedic medicine, Debris.

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Components	Percent	Nitrogen only (%)
Ammonia	1.46	1.20
Alanine	0.08	0.013
Arginine	Trace	
Aspartic acid	0.33	0.032
Cystine (half)	Trace	
Galactosamine	Trace	
Glucosamine	Trace	
Gluconic acid	0.47	0.042
glycine	8.12	1.34
Histidine	Trace	
Isoleucine	Trace	
Leucine	Trace	
Hypine or Oxidrine	Trace	
Methionine	Trace	
Phenylalanine	Trace	
Proline	0.10	0.012
Serine	0.10	0.013
Threonine	0.13	0.012
Tyrosine	Trace	
Valine	0.13	0.016

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