“Geuda” - A Market Update on this Unborn Sapphire
究打藍寶石的市場概況

Gamini Zoysa (Gemmologist, Geologist)
Ceylon Gemmological Services, Colombo, Sri Lanka
Email: gaminigz@hotmail.com

作者描述了一種出產自斯里蘭卡的乳狀藍寶石—“Geuda”究打藍寶石，它是一種非寶石級的剛玉，透明至半透明，帶有不同色調的乳白、黃或啡色。作者解釋了其乳狀成因，及熱處理的原理和影響；並提供了過去十五年產出量和價值的比較。

A non gem quality corundum, transparent to translucent in different hues of white, yellow or brown. Geuda often shows some silky or milky effect under transmitted light.

Geuda which shows the colour of thin honey when held against a light source is called “Diesel Geuda”. This is considered the most desirable variety of all geuda types.

The white cloudiness often seen in geuda is due to a dense concentration of rutile inclusions.

In Sri Lanka most of the heat treated blue sapphires on the market are from Geuda sapphires. Geuda sapphires may produce blue, yellow, orange, pink–orange, colourless, purple, pink and red colours after treatment. The final outcome depends on the chemical nature of the raw materials. It is accepted that the colour is most stable in heated blue or yellow sapphires.

Classification for “Geuda Corundum”

Important Subvarieties	Final colour after treatment
Diesel geuda	blue & vivid blue
Milky geuda	pale blue to opaque blue
Silky geuda	pale to deep blue
Ottu geuda	blue
Dhum geuda	blue
Kowangu pushparaga	orange

Fig. 1a Assorted rough Geuda

Fig. 1b Rough of Geuda sapphire

Fig. 2 Heat treatment of Geuda using a Lakmini furnace

Fig. 3 Geuda sapphires after heat treatment

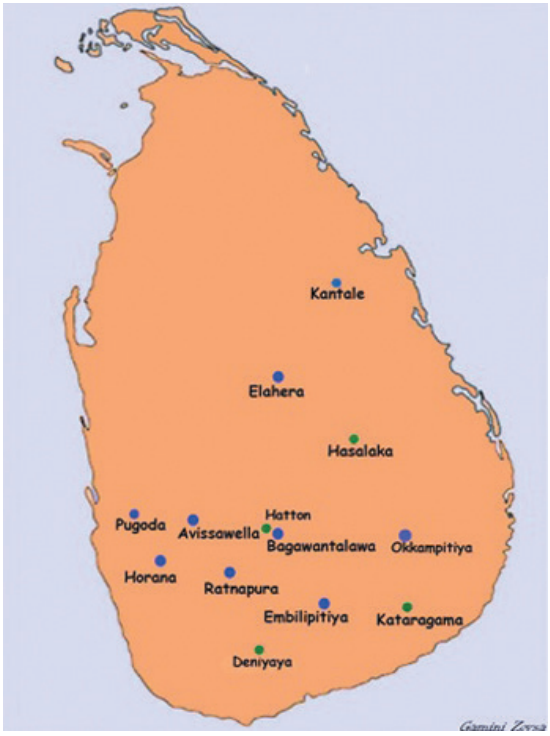

Fig. 4 Geuda sapphire mining areas in Sri Lanka

Year	Value Rs. Million	Weight (Cts)
2000	244.0	12,872,334
2001	221.5	10,232,645
2002	209.7	12,560,874
2003	255.3	6,738,312
2004	261.6	7,326,666
2005	208.6	5,439,061
2006	214.1	6,558,803
2007	203.8	7,776,901
2008	161.7	5,784,794
2009	107.7	5,139,389
2010	136.5	5,469,548
2011	146.7	14,967,718
2012	220.7	16,521,568
2013	119.2	7,429,070
2014	138.8	2,802,402
2015	102.0	5,329,184

(Source: National Gem & Jewellery Authority)

Fig. 5 Geuda Exports from Sri Lanka

Element	Concentration	Peak (cps)	Background (cps)
MgO	0.00 ppm	0.00000	40.275
SiO_2	0.00 ppm	0.00000	24.245
TiO_2	2064 ppm	5.9560	2.0240
V_2O_3	73 ppm	0.37450	1.1255
Cr_2O_3	0.00 ppm	0.00000	0.26000
MnO	0.00 ppm	0.00000	0.56500
Fe_2O_3	1169 ppm	5.2927	0.74726
Ga_2O_3	102.5 ppm	2.4994	0.62557
ZrO_2	[4.3] ppm	0.34014	3.2899
Nb_2O_5	15.4 ppm	1.3254	13.825
SnO_2	[2.3] ppm	0.048937	0.52106
Ta_2O_5	0.00 ppm	0.00000	0.37500
WO_3	0.00 ppm	0.00000	1.9650
PbO	0.00 ppm	0.00000	0.22500
Al_2O_3	99.657% Diff		

Fig. 6 EDXRF Analysis Report, Thermo Electron Elements found in Geuda sample
(Analysis: By Dr Edward Liu)

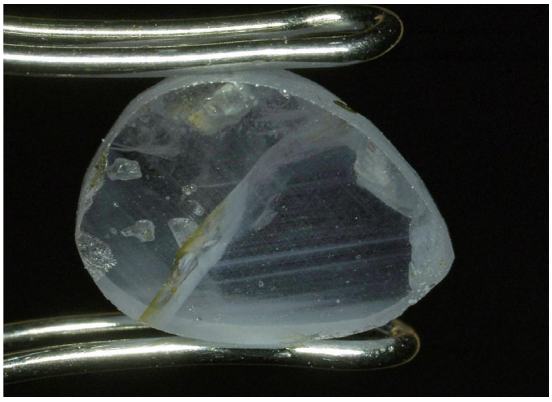

Fig. 7 Microscopic observation of a geuda showing rutile needles & silky inclusions.
(Photo: Dr Edward Liu)

Of the other localities which produce Geuda sapphires, Australia, Myanmar, Tanzania, Madagascar, Cambodia, Vietnam and India are the main producers.

Ti^{4+}, Ti^{3+}, Fe^{3+}, Fe^{2+} are present in Geuda as well as in blue sapphires and the colour of the sapphires depends largely on the concentration of these elements. Heat treatment therefore alters the concentration of the 2 elements. A reducing atmosphere should be applied to produce a desirable blue colour from a Geuda; but to lighten a darker or opaque blue or for yellow stones an oxidizing atmosphere should be used.

(Chemistry & identification of heat-treated sapphires will be discussed in a future article.)

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港九珠寶首飾業文員會
Hong Kong & Kowloon Jewellers' & Goldsmiths' Employees' Association
香港 皇后大道中178-180 號 香港珠寶大廈13樓
13/F Hong Kong Jewellery Bldg, 178-180 Queen's Road C, Hong Kong
☎ (852)2543 9634