

**Crystal Data:** Monoclinic. *Point Group:* 2/m. Prismatic to 0.3 mm as pseudomorphs after orthorhombic trihydrate, display {100}, {hk0}, {010}, and {0kl}, rounded edges, and twinning on (010); and as aggregates in 0.1 mm crusts of interlocking irregularly contoured platelets to 0.03 mm.

**Physical Properties:** *Cleavage:* On {010}, perfect. *Fracture:* n.d. *Tenacity:* Crumbly. Hardness = 2.5 D(meas.) = 2.10(3) D(calc.) = 2.251

**Optical Properties:** Transparent. *Color:* White, grayish white aggregates. *Streak:* White. *Luster:* Vitreous.

*Optical Class:* Biaxial (-).  $\alpha = 1.424(3)$   $\beta = 1.550(3)$   $\gamma = 1.65(1)$   $2V(\text{meas.}) = 80(2)^\circ$   $2V(\text{calc.}) = 77^\circ$  *Dispersion:*  $r > v$ , very weak. *Orientation:*  $Y \wedge c = 20^\circ$ .

**Cell Data:** *Space Group:* C2/c.  $a = 11.995(5)$   $b = 5.632(2)$   $c = 9.967(7)$   $\beta = 128.34(4)^\circ$   $Z = 4$

**X-ray Powder Pattern:** Boca Rica mine, Sapucaia do Norte, Galiléia Co., Minas Gerais, Brazil. 4.803 (100), 4.699 (84), 2.996 (58), 4.855 (26), 3.907 (23), 3.622 (22), 2.679 (14)

Chemistry:	(1)	(2)
MnO	39.99	39.63
Al <sub>2</sub> O <sub>3</sub>		0.24
Na <sub>2</sub> O		0.21
C <sub>2</sub> O <sub>3</sub>	34.90	40.24
<u>H<sub>2</sub>O</u>	<u>19.62</u>	<u>20.13</u>
Total	94.96	100.00

(1) Boca Rica mine, Sapucaia do Norte, Galiléia Co., Minas Gerais, Brazil; EDS and CHN analyses; corresponds to (Mn<sub>1.11</sub>Na<sub>0.01</sub>Al<sub>0.01</sub>) $\Sigma=1.13$ (C<sub>1.94</sub>O<sub>4</sub>)·2.15H<sub>2</sub>O. (2) Mn(C<sub>2</sub>O<sub>4</sub>)·2H<sub>2</sub>O.

**Occurrence:** A secondary mineral in granite pegmatites.

**Association:** Triphylite, phosphosiderite, frondelite, strengite, cyrilovite, bermanite, rockbridgeite, huréaulite, tavorite, reddingite, heterosite, laueite.

**Distribution:** From the Boca Rica mine, Sapucaia do Norte, Galiléia Co., Minas Gerais, Brazil [TL], from Parsettens, Grisons, Switzerland, the Lecht Mines, Banffshire, Scotland, and the Morefield Pegmatite, Amelia, Virginia, USA. In the Black Forest, Germany, at the Clara Mine, Oberwolfach, Wolfach Valley, Baden-Württemberg; at Ortenberg near Offenburg; and at Gremmelsbach near Triberg,

**Name:** Honors Marie Louise Lindberg (-Smith) (b. 1918), from the US Geological Survey, who described several new minerals from the nearby Sapucaia quarry (frondelite, faheyite, moraesite, barbosalite, and tavorite).

**Type Material:** Geosciences Museum, Institute of Geosciences, University of São Paulo, Brazil (DR542).

**References:** (1) Atencio, D., J.M.V. Coutinho, S. Graeser, P.A. Matioli, and L.A.D. Menezes Filho (2004) Lindbergite, a new Mn oxalate dihydrate from Boca Rica mine, Galiléia, Minas Gerais, Brazil, and other occurrences. *Amer. Mineral.*, 89, 1087-1091. (2) Echigo, T. and M. Kimata (2008) Single-crystal X-ray diffraction and spectroscopic studies on humboldtine and lindbergite: weak Jahn-Teller effect of Fe<sup>2+</sup> ion. *Phys. Chem. Minerals*, 35, 467.