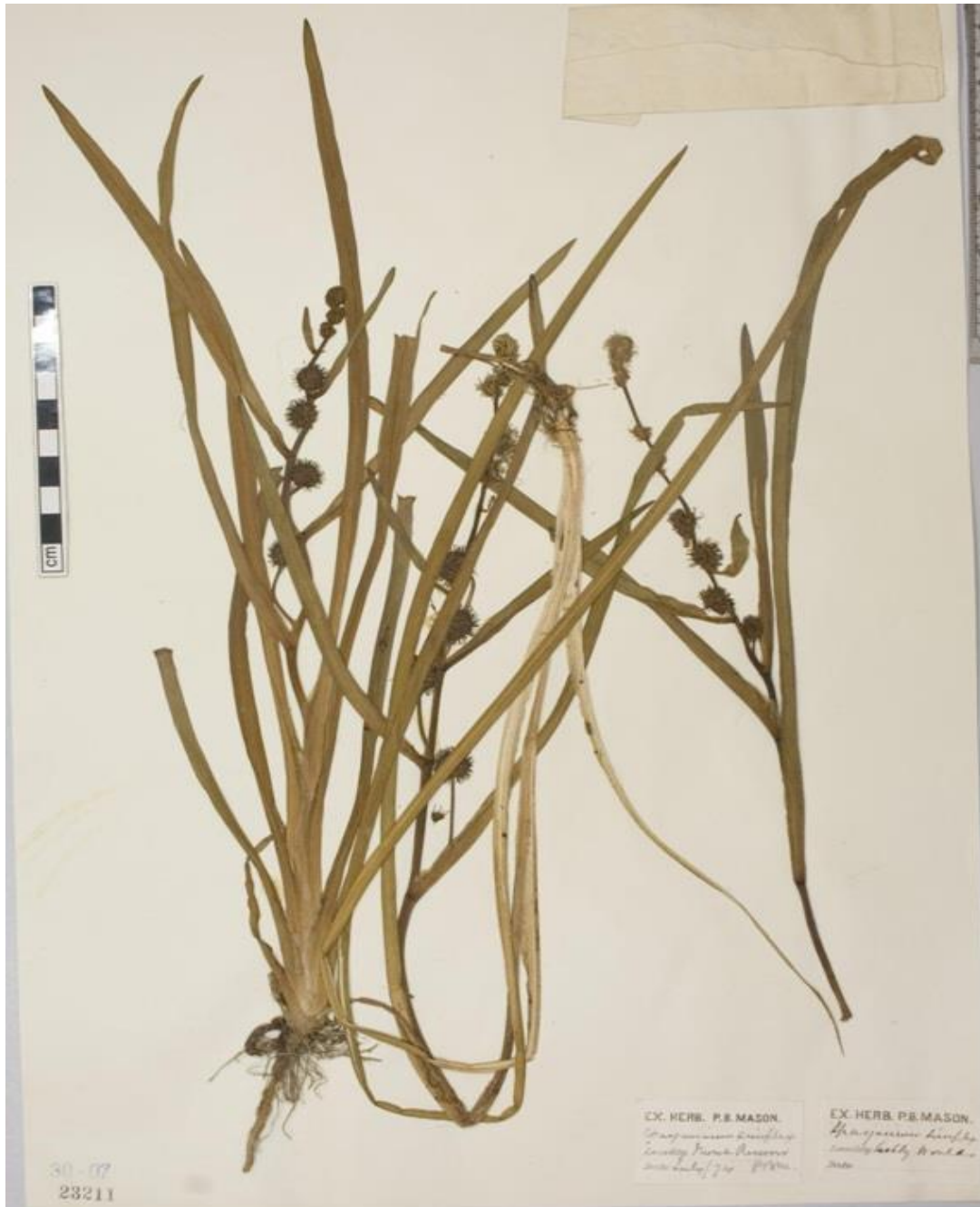


**Supplementary material**  
**Calculating plant surface area**

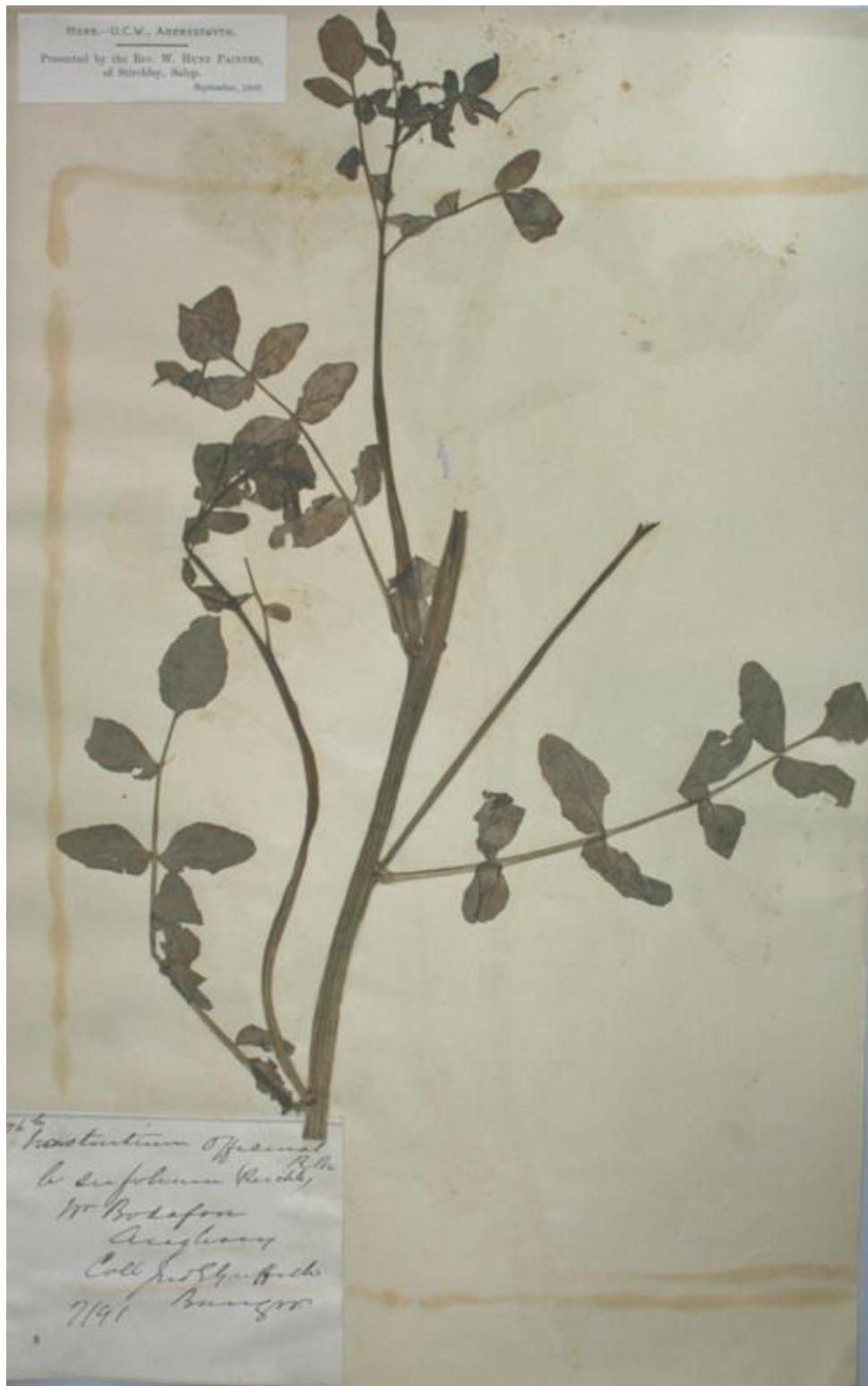
a) Photographs that were used to make estimated drawings of the original plant samples in order to calculate surface area. A full reference list is given at the end of a).



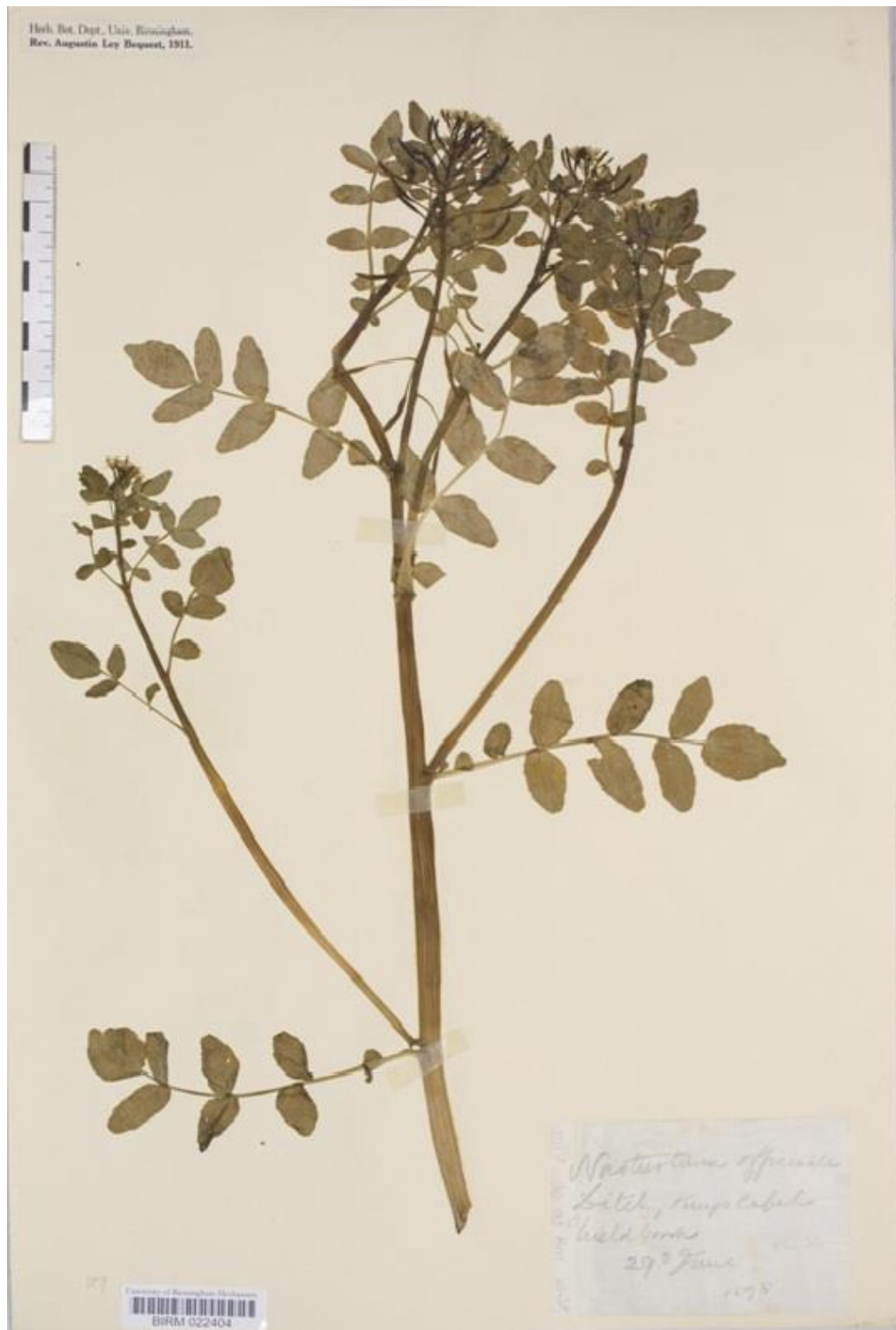
*Sparganium emersum*. Martin (2010)



*S. emersum*. Ricketson, J. (2001)



*Rorripa nasturtium-aquaticum* Liffen, C. (2008) (species now named *Nasturtium officinale*).



*Rorripa nasturtium-aquaticum* nacs12 (2010) (species now named *Nasturtium officinale*).



*Ranunculus penicillatus pseudofluitans*. Humphrey (2007)





*Ranunculus penicillatus pseudofluitans*. Barnett (2008)

Barnett K (2008) Herbarium specimen: *Ranunculus penicillatus subsp pseudofluitans*, specimen number, 263294. Botanical Society of the British Isles.

Humphrey T (2007) Herbarium specimen: *Ranunculus penicillatus*, specimen number, 238809. Botanical Society of the British Isles.

Liffen C (2008) Herbarium specimen: *Rorripa nasturtium-aquaticum*, specimen number, 143275. Botanical Society of the British Isles.

Martin M (2010) Herbarium specimen: *Sparganium emersum*, specimen number, 285808. Botanical Society of the British Isles

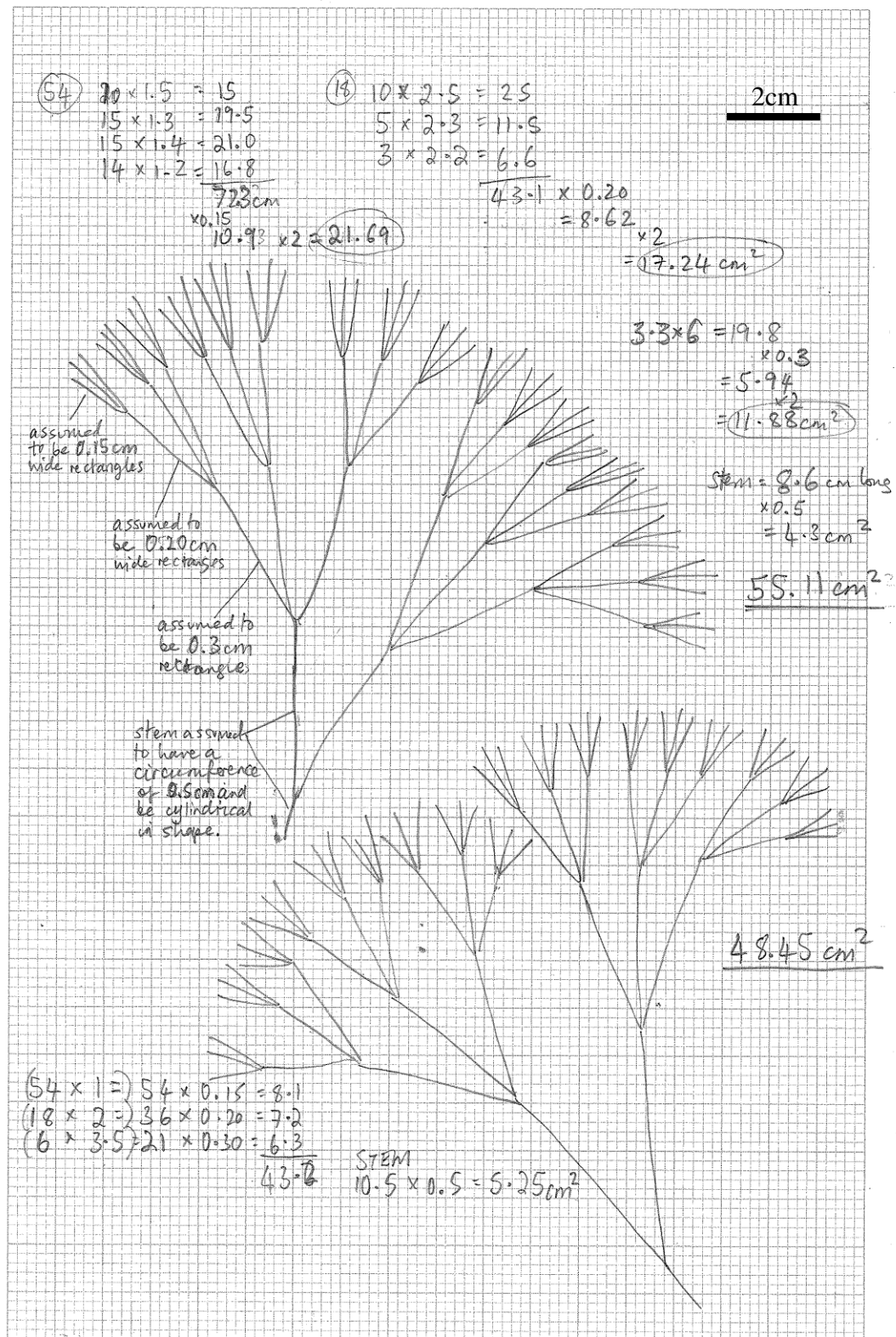
Ricketson J (2001) Sparganiaceae. J Arizona – Nevada Acad Sci 33.

**b) Drawings representing the plant samples; calculations of surface area.**

Six different drawings estimated to resemble the plant samples taken from the Millstream were used to calculate an approximate average surface area of the samples for each plant.

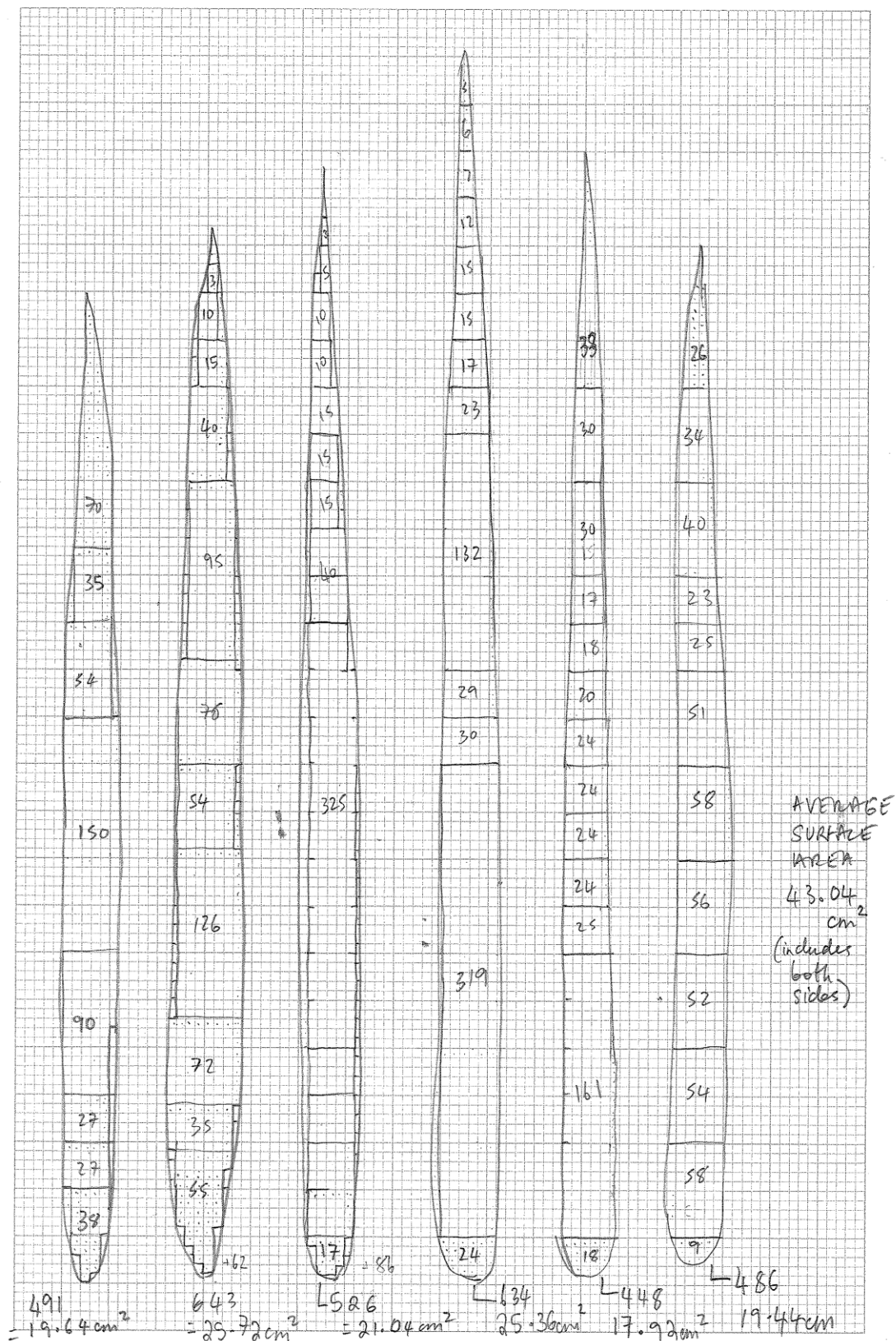
The stems of *Ranunculus sp.* and *R. nasturtium-aquaticum* were assumed to be cylindrical, as described by Sleight *et al.* (1992). Thus the stem surface area ( $\text{cm}^2$ ) was estimated from the total stem length measured from the drawings, multiplied by an approximate circumference of 5mm and 8 mm respectively.

i) *Ranunculus penicillatus pseudofluitans* Average surface area = 46.00 cm<sup>2</sup>





ii) *Sparganium emersum*. Average surface area =  $43.03 \text{ cm}^2$ .



iii) *Nasturtium officinale* (formerly *Rorripa nasturtium-aquaticum*). Average surface area = 43.01  $\text{cm}^2$

