

A Sanskrit Mathematical Anthology

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I Introduction

I.1 Text

A small mathematical work in Sanskrit is appended to Śrīdhara's *Triśatī* in a manuscript preserved in Hemacandrācārya Jaina Jñāna Mandira, Pāṭaṇa, North Gujarat. The former begins in the same line of writing in which the latter ends and both have been copied by the same person named Harṣatilaka, who calls himself *muni* (abbreviated μ°) or an ascetic.

The work contains neither the title of the work nor the name of the author. It does not have a *maṅgala śloka* (an introductory auspicious verse in which the author expresses his homage to god) that every genuine Sanskrit work should have. It has a very simple colophon by the scribe: '(This anthology was) written down by Muni Harṣatilaka. Let there be good fortune'; but it does not have a colophon of the work itself. None, except one (verse 30), of the mathematical rules and examples treated in it occurs in the *Triśatī*, which Harṣatilaka copied immediately before he began to work on it. But the first eight verses are found also in the *Pāṭīganīta*, another, larger work of Śrīdhara: they are most probably quotations either from that work or from his lost work, *Navaśatī*.¹ The last verse (31) mentions a Jayaśekhara: '(This was) told by the venerable Jayaśekhara'; this Jayaśekhara seems to be the author either of verses 17–31 (section 3) or of verse 31 only.

These circumstances indicate that the work was not a genuine, original work but a loose compilation or anthology of earlier rules and examples accompanied by brief prose commentaries on the examples. In that sense, it resembles the *Bakhshālī Manuscript*² and another Pāṭaṇa manuscript, HJJM 8894.³ Presumably, the compilation was meant to be an appendix to the *Triśatī*.

I have not so far been able to find other manuscripts of the same work but that the present manuscript is not the autograph but a copy is proved by a number of

¹For the *Navaśatī* see Hayashi 1995b, 235.

²Hayashi 1995a.

³Hayashi 1995a, 464–484.

corruptions of the text (see the footnotes in § II).

I.2 Contents and sectioning

All the topics treated in the anthology (see Table 1) belong to the field called *pāṭī-gaṇita* or ‘mathematics of algorithm’ in contrast to *bīja-gaṇita* or ‘mathematics of seeds’ (i.e., algebra) and are divided in three sections:

section 1: verses 1–8, section 2: verses 9–16, section 3: verses 17–31.

Section 1, all verses of which are found also in the *Pāṭīgaṇita*, ends with the numerical figure ‘1’ and section 2 with ‘cha // śrī //’; both are end marks and commonly found in Indian manuscripts.

Section 1 treats algebraic problems on fee and price: they belong to the category called ‘the procedure for mixture’ (*mīśraka-vyavahāra*) in *pāṭī*; section 2 deals with problems on buying and selling: they belong to ‘the procedure for mixture’ in some texts and to ‘the proportion’ (*anupāta*) in others; and section 3 treats problems on geometry and mathematical series: they belong to ‘the procedure for field (or plane figures)’ (*kṣetra-vyavahāra*), ‘the procedure for excavation (or solid figures)’ (*khāta-vyavahāra*), and ‘the procedure for series’ (*śreḍhī-vyavahāra*).

I.3 Characteristic features

As told above, eight verses are commonly found in the anthology and in the *Pāṭī-gaṇita* of Śrīdhara (8th century) and they are not found in the other extant works of his, *Trīśatī* and *Gaṇitapañcaviṃśī*. The *Pāṭīgaṇita* is preserved in a uniquely extant, incomplete manuscript and a larger work called *Navaśatī* of the same author is not available now. The anthology is therefore an important document for the study of the transmission of Śrīdhara’s works.

One of the topics common to the anthology and the *Pāṭīgaṇita* is the Indianized hundred fowls problem. The anonymous commentator of the *Pāṭīgaṇita* had given six solutions to it. The prose commentary of the anthology gives nine solutions. See under verses 7–8 in § IV.1.2 below.

The anthology elaborately treats the buying-selling problem. The only other texts comparable to it in this regard are the *Bakhshālī Manuscript* and the *Mahā-siddhānta*. See § IV.2 below.

As mentioned above, the anthology (verse 31) refers to a mathematician called Jayaśekhara, who is new to us. A Jayaśekhara Sūri wrote a *Kṣetrasamāsa* (Jaina geographical/geometrical work), several manuscripts of which (the oldest one is dated 1579 C. E.) are preserved in Rajasthan and Gujarat;⁴ an investigation of those manuscripts may throw new light on the problem of the identification of our Jayaśekhara.

⁴CESS, vol. 3, p. 63a, and vol. 5, p. 117a.