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The Croatian national open access journal platform

Introduction

The differences between scientifically peripheral and mainstream countries have been widely discussed in the literature.^{1–3} Scientists from the periphery, especially those active in scientific, technical and medical (STM) disciplines, occasionally publish high-quality reports in internationally prominent journals. However, most of their scientific production is reported in local journals. Although these journals may publish important results, they often do not reach the wider scientific community for technical reasons (e.g. language barrier or distribution) or simply because of their ‘invisibility’.² The national character of these journals, particularly if they are published in languages other than English, minimizes their international subscriptions, readership, and thus influence.

However, local journals remain, for many reasons, a mandatory component of local scientific infrastructure and policy.⁴ They connect their authors and readers more closely, and can focus on topics and subjects of local character but of international significance.⁵ The editorial staff of these journals can work very closely with authors and reviewers. Their editors may have a dual role as educators and scientific mentors.⁶ Local journals can develop an author-friendly policy that improves the quality of scientific publishing, and serves as an important educational and training platform. Their readership is better defined, and the content can offer more practical and applicable information for the local community. Additionally, papers published in the local language may contribute to the development of discipline-based vocabularies, especially in fields where the English language is globally dominant, such as the sciences and biomedicine.

Even large publishers such as Thomson

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ABSTRACT. *Until recently, Croatian scientific journals were accessible only in print form and only to a relatively small audience. A national online journals platform was therefore planned to offer publishers a simple tool for building online versions of their journals and to make them open access. The platform, named Hrčak, was launched in 2006, supported by governmental funds. It currently includes 170 open access (OA) journals. Most journals include backfiles from 2006 onwards; the average archived period is 6.3 years. 56.5% of the journals come from the fields of social sciences and humanities. Metadata from the Hrčak platform are regularly harvested by OA repositories. To increase the number of Croatian journals covered by relevant bibliographic and full-text databases, Hrčak has forged links with Elsevier, Thomson Reuters and EBSCO. So far, the main achievements include assisting publishers in the process of electronic publishing, and improving accessibility to Croatian scientific output.*



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Reuters have recognized the importance of 'regional scholarship'. More than 700 regional journal titles have been recently added to the list of journals indexed in *Web of Science*. James Testa, the Senior Director, Editorial Development & Publisher Relations of Thomson Reuters, claimed that 'bringing the best of these regional titles into the *Web of Science* will illuminate regional studies that would not otherwise have been visible to the broader international community of researchers'.⁷ Inclusion in a subject-oriented and/or interdisciplinary database may significantly improve the visibility of a local journal.

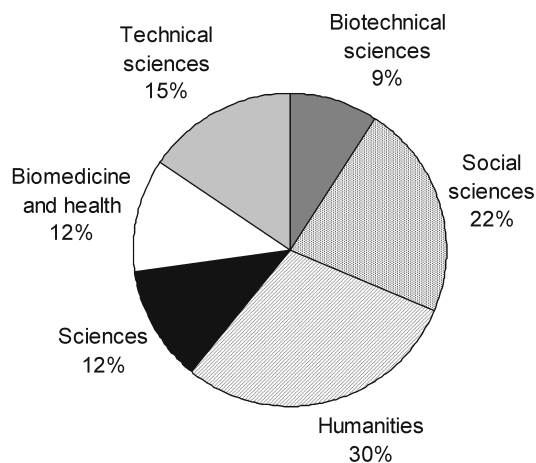
An optimum strategy for making scholarly information more visible and accessible should include ensuring permanent open access to that information.⁸ The Budapest Open Access Initiative (BOAI) defines open access as the 'world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds', and recommends helping existing journals that elect to make the transition to open access. Among methods for covering the costs, BOAI mentions 'the foundations and governments that fund research'.⁹

The Croatian scientific landscape

Croatia is an EU candidate country; its gross domestic product (GDP) per capita in 2006 was \$9,661 and the annual growth rate

in GDP was 4.8%.¹⁰ Total investment in research and development (R&D) reached 1% of GDP (approximately €316.5m.) in 2005, of which 58% came from the government and 41% from the business sector.¹⁰ In a strategic document issued in 2006, the government announced plans to increase the R&D allocation to 3% of GDP by 2010, two-thirds of which should come from the private sector;¹¹ however, at present R&D is to a large extent concentrated in institutions of higher education and public institutes. The Ministry of Science, Education, and Sports (MSES) retains overall responsibility for the science and educational system; it is the main policy-making body and holds budgetary responsibility and control. In 2005 the MSES allocated approximately €102m. for research equipment, publishing activities, conferences, special programs for recruitment of junior researchers, and other service activities necessary for R&D.¹² The heading 'publishing activities' includes financial support to scientific journals and books, mainly university textbooks. During 2007 MSES provided approximately €2m. in support of 220 scientific, professional, and popular science journals.¹³ In a document supporting the financing criteria, the MSES explained that only journals of cultural, national or regional importance would receive financial support. In addition, only non-profit journals would be subsidized. These journals must meet basic publishing standards of regularity, peer review, and coverage by at least one international indexing and abstracting ser-

Figure 1. Discipline distribution of journals financially supported by the Croatian Ministry of Science, Education and Sports in 2007.



vice. In addition, they should have a website containing, at a minimum, journal information and the table of contents of the latest issue;¹⁴ however, a full-text online version is not a prerequisite for obtaining government subsidies.

The founders and owners of Croatian scientific journals are mainly academic and research institutions or learned and professional societies. As Figure 1 shows, over half of the journals are in the social sciences and humanities.¹³ In these disciplines the 'national publication model', as defined by Zitt *et al.*,¹⁵ plays an important role. However, the outcomes of genuine scholarly research, even those primarily related to national aspects, are still worth communicating – in an appropriate form – to scholars in other countries.¹⁶

Until recently, almost all Croatian scientific journals were accessible only in print form and to a relatively small audience. The recent governmental initiative to stimulate research activity also addresses: (i) better visibility of local journals to the international scientific community; (ii) their role in preserving cultural identity; and (iii) their role in raising public awareness and confidence in science and technology (S&T). In its document on the S&T policy for 2006–10, MSES specified that 'the S&T system, which is financed by public resources, should be open to the public . . . and . . . results of R&D financed by public resources must be accessible to the public in the form of open publications or databases'.¹¹ This initiative gave rise to the idea of a centralized journal repository that could provide technical support for electronic publishing and archiving, together with the introduction of international standards, and a single access platform. Further developments could then enable a transition to a distributed model, based on collaborative partnerships.

Online platform for Croatian scientific journals

Croatian scientific journals share many problems with other non-mainstream journals, including low visibility, difficulties in distribution, small number of subscribers

(mainly domestic), low citation rate, insufficient funding, poor technical infrastructure, lack of expertise in online publishing, etc.¹⁷ All of these problems are particularly acute for journals in the fields of humanities and social sciences. The idea of establishing a common online publishing platform for Croatian scientific journals originated from a small team of information specialists and librarians from the Croatian Information and Documentation Society (HID). The Society brings together professionals interested in the improvement of information and documentation services, some of whom have been engaged in promotion of the OA movement in Croatia. The project proposal was written in co-operation with Zagreb University Computer Center (SRCE), and focused primarily on improving the online accessibility of Croatian scientific journals by helping the editorial offices to create online versions of their journals (Figure 2). From the very beginning, full attention was also paid to enabling completely free and unrestricted access to all the journals included. The project was named after the hamster (*hrčak* in Croatian), a small rodent which stores food in pouches in its cheeks to bring it back to the colony to be eaten later; the Croatian word is often used to denote a hoarder. The project's main objectives were:

- a single common portal;
- a central repository for journals' metadata records;
- a central repository for full-text journal articles;
- free online availability;
- data sharing about Croatian scholarly publications among different interdisciplinary and subject-oriented repositories and databases.

The timeline and financial plans were approved by the MSES in 2005, and since then MSES has covered all the costs of portal development and maintenance, as well as funding other projects included in the so-called Croatian Scientific Portal.¹⁸ In addition to *Hrčak*, the Croatian Scientific Portal includes the *Croatian Scientific Bibliography* (CROSBI), *Who's Who in Science in Croatia*, and *A Pair of Compasses* (an inventory of the scientific equipment procured by the

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The screenshot shows the Hrčak portal interface. At the top, it features the Hrčak logo and the text 'Portal of scientific journals of Croatia'. The main content area is for the journal 'Croatica et Slavica Iadertina', displaying its cover image and key information: ISSN 1845-6839, contact details for the University of Zadar, and an article search bar. On the left, there is a navigation menu with categories like 'Natural sciences', 'Biomedicine and health', and 'Humanities'. On the right, there are sections for 'My profile' with a login form and 'Article search' options.

Figure 2. Home page of a journal (*Croatica et Slavica Iadertina*) on the Hrčak platform.

MSES). Hrčak¹⁹ was publicly launched in February 2006. It provides:

- a simple interface, free of charge to publishers, for the production of online versions of the journals;
- technical support for e-publishing, including development, maintenance, and data protection and security;
- Dublin Core (DC) metadata schema for bibliographic control;
- Open Archives Initiative – Protocol for Metadata Harvesting (OAI-PMH) protocol for metadata exchange and interoperability;
- a single interface for readers;
- long-term archival and preservation functions.

Publishers are responsible for:

- regular uploading of the full text of published issues;
- accuracy of the content;

- metadata input at journal, issue, and article levels.

From the very beginning, Hrčak was oriented to various groups of users:

- Publishers have a free, simple and fast tool for the production of online versions of their journals. Special attention has been given to multilingual support because many journals publish articles not only in Croatian and English, but also in 17 other languages (e.g. German, French, Italian, Latin, Hungarian).
- Authors can easily see how many times their articles are accessed and downloaded.
- Higher education and research institutions achieve wider dissemination of their research results when these are published in OA local journals.
- Readers can search, browse, download, print, copy, and redistribute the journal items (thanks to the widespread OA pol-

in 2003 only 21 Croatian scientific journals had online versions

icy). The user interface is available in Croatian and English.

- The general public can easily access the results funded by public money.
- A special 'user' category – Web robot software programs which automatically harvest metadata – is enabled to disseminate information about articles from Croatian journals to the international scientific community.

Impact of the *Hrčak* platform

Analysis in 2003 showed that 21 Croatian scientific journals (less than 10%) had online versions.²⁰ Therefore, *Hrčak* was initially planned to offer publishers a simple tool for building online versions of their journals. To attract as many publishers as possible, the platform was designed in co-operation with them and according to

their needs. In order to facilitate efficient dissemination of the content, the OAI-PMH was implemented from the start. Although OA was not a fundamental condition for joining the *Hrčak* platform, after considering its advantages and disadvantages, almost all journals adopted OA. The number of journals included on the platform exceeded all expectations: within two months of launch there were 50, within one year there were more than 120, and at the beginning of 2009, after three years, there were 170 (Figure 3). The growth in the number of full-text articles is shown in Figure 4.

As of 25 January 2009, *Hrčak* included 170 full-text journals, all of which provided OA; of these 144 were financially supported by the MSES in 2007 and 26 were not (Figure 5); nearly all these 26 journals were supported by other government departments

Figure 3. Journals joining the *Hrčak* platform between 1 February 2006 and 25 January 2009.

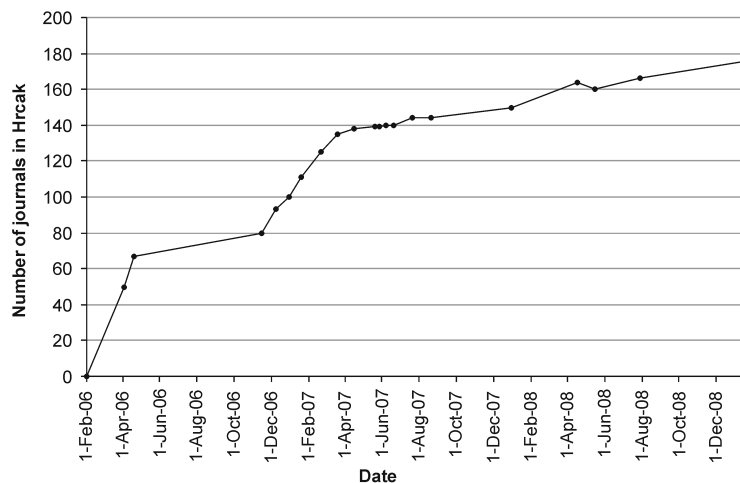
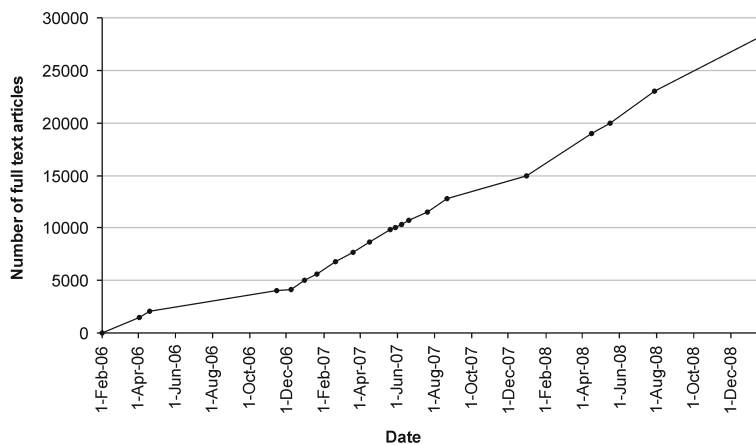


Figure 4. Full-text articles added to the *Hrčak* platform between 1 February 2006 and 25 January 2009.



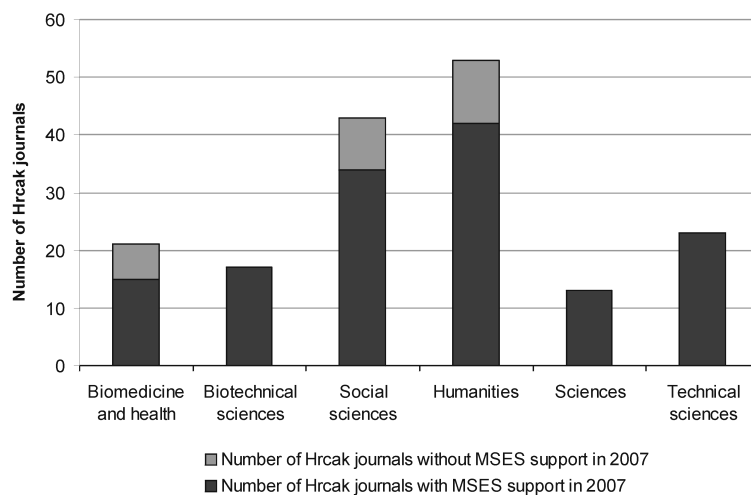


Figure 5. MSES support for Hrcak journals in 2007, by discipline.

(e.g. Ministry of Culture); only three were published on a commercial basis. The platform also included six journals which provided only bibliographic data on published issues; these have been excluded from our analysis. In 2007, MSES also supported 76 other journals not included in Hrcak, of which 16 (21%) are accessible online using different platforms, 12 of them offering OA.

Most of the journals started archiving from issues published in 2006; however, some of them archived their entire publication backfile. So far, 19 journals have archived all their back issues, ranging from 3 to 37 years. The average archived period is 6.3 years, and a total of 28,388 full-text articles has been archived as of 25 January 2009, all of them OA (Table 1). The distribution of journals by discipline shows that the majority were in the fields of social sciences and humanities.

Table 1. Discipline and number of archived items of journals included in Hrcak

Scientific field	No. of journals in Hrcak	No. of issues	No. of articles
Biomedicine and health	21	327	5,575
Biotechnical sciences	17	301	2,651
Social sciences	43	563	5,947
Humanities	53	525	7,729
Sciences	13	208	1,948
Technical sciences	23	443	4,538
Total	170	2,367	28,388

The impact of Hrcak on Croatian scientific publishing can be seen from the rapid growth in the number of journals in the Hrcak repository. This shows that Croatian publishers needed a simple and easy-to-use publishing platform.

Metadata from Hrcak are harvested not only by free repositories, databases, and services (e.g. OAIster, Base, Google Scholar), but also by commercial databases. For example, co-operation with Elsevier and Thomson Reuters has been established in order to increase the number of Croatian journals covered by their services, and to speed up the indexing process. Data from Hrcak are regularly harvested by Scopus, without their publishers needing to provide printed copies. Co-operation with Thomson Reuters resulted in an increased number of Croatian journals being indexed in *Web of Science* (from 16 in 2007 to over 40 in 2008); a metadata harvesting procedure is in the testing phase. The replication of Hrcak metadata in other repositories and databases has significantly improved the visibility of Croatian journals; this is illustrated by the fact that usage statistics indicate readers at institutions which did not subscribe to the journals' printed versions.

The Hrcak platform has an average of 10,400 unique visits and 34,500 page views per day. Approximately half of the visitors are from Croatia, and the rest from other countries (e.g. Bosnia and Herzegovina, USA, Czech Republic, Serbia, Germany). The statistics show that *Rasprave Instituta za*

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hrvatski jezik i jezikoslovlje (*Treatises of the Institute of Croatian Language and Linguistics*), a journal in the field of humanities, has had the greatest number of visits – 41,957 (February 2008–25 January 2009).

Hrčak also serves as a platform for enhanced co-operation and communication between the publishers and editorial offices of Croatian scientific journals. Its e-mail discussion list provides for information exchange, asking and answering questions, and sharing experiences and expertise. The *Hrčak* Development Team (HDT) regularly organizes meetings and lectures covering topics of interest to publishers, editors, and authors. These attempts to improve communication between publishers and authors have raised their awareness of new trends in scientific publishing such as accessibility, sustainability, digital preservation, open peer review, post-publication review and comment, etc.

Future perspectives

Despite *Hrčak*'s success and popularity, some urgent issues remain to be resolved. Most pressing of all is the issue of finance. Until now, the project has been financed by the government on an annual basis (€20,000 per year). A complicated administrative procedure means that renewal of the funding can be delayed, which can hold up routine technical work. In the near future we aim to impress on the government the importance of this project by putting forward more compelling arguments about *Hrčak*'s crucial role in the process of scholarly publishing. The second important issue lies in editorial offices; they are not always sufficiently accurate in the metadata they provide and the full-text articles they upload. Some improvements could also be made at OAI-PMH level to reduce the inconsistencies of the harvested data.

In the near future HDT will support editorial offices in the implementation of the Open Journals System (OJS), a tool for facilitating their editorial work.²¹ A few editorial offices, which already use OJS and which have even built a customized version in Croatian, are ready to help others learn how to use it and then show them how to make the

necessary changes in their management systems. HDT will also focus on a data exchange interface between local OJS systems and the *Hrčak* platform.

The most important planned future improvements in functionality are:

- harvesting of OAI-PMH-compatible (and other) metadata from Croatian journals that are not included in *Hrčak*;
- attracting additional journals;
- standardizing archived PDF documents among different publishers, and implementing a standard XML schema;
- providing more usage data to editors;
- enabling editors to receive direct feedback from their users;
- improving the input interface for *Hrčak*, to make data input and control simpler and less time-consuming;
- offering continuous technical support for OJS, as well as training.

Close co-operation with publishers and authors, as well as user feedback, will help HDT to develop *Hrčak* into a comprehensive, primarily OA national journals platform. *Hrčak* may act as an example of an efficient solution for improved international and/or local visibility of the scientific information produced by small, peripheral scientific communities.

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References

1. Gibbs, W.W. 1995. Lost science in the Third World. *Scientific American*, 273: 92–9. http://www.sciamedigital.com/index.cfm?fa=Products.ViewIssuePreview&ARTICLEID_CHAR=082AA6E7-13D1-4610-81F4-EEC68867A24
2. Marušić, A. and Marušić, M. 1999. Small scientific journals from small countries: breaking from a vicious circle of inadequacy. *Croatian Medical Journal*, 40: 508–14. <http://www.cmj.hr/1999/40/4/10554353.pdf>
3. Canagarajah, A.S. 1996. Nondiscursive requirements in academic publishing, material resources of periphery scholars, and the politics of knowledge production. *Written Communication*, 13: 435–72. <http://dx.doi.org/10.1177/0741088396013004001>
4. Sambunjak, D., Huić, M., Hren, D., Katić, M., Marušić, A., Marušić, M. 2009. National vs. international journals: views of medical professionals in Croatia. *Learned Publishing*, 22: 57–70. <http://dx.doi.org/10.1087/095315108X378785>

5. Kawa-Jump, S. *How to Publish Your Articles: A Complete Guide to Making the Right Publication Say Yes*. New York, Square One Publishers, 2001.
6. Lett, R. 2002. *East and Central African Journal of Surgery: The Canadian Connection. East and Central African Journal of Surgery*, 7: 3–4. <http://www.bioline.org.br/pdf?js02001>
7. Testa, J. *Regional Content Expansion in Web of Science: Opening Borders to Exploration*. Available at http://isiwebofknowledge.com/products_tools/multidisciplinary/webofscience/contentexp/expansionessay/ (accessed 17 February 2009)
8. Packer, A.L. The SciELO project for Latin America and Caribbean: advances and challenges of an emerging model for electronic publishing in developing countries. In *Electronic Journal Publishing: A Reader Version 2.0*. Oxford, INASP, 2001. Available at <http://www.inasp.info/file/370/electronic-journal-publishing-a-reader-version-20.html> (accessed 28 July 2008)
9. Budapest Open Access Initiative. 2002. Available at <http://www.soros.org/openaccess/read.shtml> (accessed 2 February 2009)
10. *Statistical Yearbook of the Republic of Croatia 2007*. Zagreb, Central Bureau of Statistics of the Republic of Croatia, 2007. Available at http://www.dzs.hr/Hrv_Eng/ljetopis/2007/00-sadrzaj.pdf (accessed 11 September 2008)
11. *Science and technology policy of the Republic of Croatia: 2006–2010*. Zagreb, Ministry of Science, Education and Sports, 2006. Available at <http://public.mzos.hr/Default.aspx?sec=2496> (accessed 11 September 2008)
12. *Croatia – Overview and Latest ERAWATCH information*. Available at <http://cordis.europa.eu/erawatch/index.cfm?fuseaction=ri.content&countryCode=HR&topicID=4> (accessed 11 September 2008)
13. Macan, B. and Stojanovski, J. 2008. Analiza novčane potpore Ministarstva znanosti, obrazovanja i športa hrvatskim znanstvenim časopisima [Analysis of the Financial Support by the Croatian Ministry of Science, Education and Sports to Croatian Scientific Journals]. *Kemija u industriji*, 57: 115–22. <http://knjiznica.irb.hr/hrv/kui/vol57/broj03/115.pdf>
14. *Izvod iz Pravila o novčanom podupiranju znanstvene izdavačke djelatnosti (knjiga i časopisa)* [Extract from Regulations about financial support of scientific publishing (books and journals)], 2007. Available at <http://public.mzos.hr/Default.aspx?sec=2142> (accessed 28 July 2008)
15. Zitt, M., Perrot, F. and Barre, R. 1998. Transition from national to transnational model and related measures of countries performance. *Journal of the American Society for Information Science*, 49: 30–42. [http://dx.doi.org/10.1002/\(SICI\)1097-4571\(1998\)49:1<30::AID-ASI5>3.0.CO;2-3](http://dx.doi.org/10.1002/(SICI)1097-4571(1998)49:1<30::AID-ASI5>3.0.CO;2-3)
16. Moed, H.F. Differences between science, social sciences and humanities. In: Moed, H.F. *Citation analysis in research evaluation*. Dordrecht, Springer, 2005, pp. 147–79.
17. Marušić, M. and Marušić, A. 2001. Good editorial practice: editors as educators. *Croatian Medical Journal*, 42: 113–20. <http://www.cmj.hr/2001/42/2/11259730.pdf>
18. Hrvatski znanstveni portal [Croatian Scientific Portal]. Available at: http://www.znanstvenici.hr/index_en.php
19. Hrcak: Portal of scientific journals of Croatia. Available at <http://hrcak.znanstvenici.hr>
20. Konjević, S. 2003. Hrvatski znanstveni časopisi na internetu [Croatian scientific journals online]. *Vjesnik bibliotekara Hrvatske*, 46: 111–8. [http://www.hkdrustvo.hr/datoteke/102/vbh/God.46\(2003\),br.3-4](http://www.hkdrustvo.hr/datoteke/102/vbh/God.46(2003),br.3-4)
21. Public Knowledge Project: Open Journal System. Available at <http://pkp.sfu.ca/?q=ojs> (accessed 4 February 2009)

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