

Updates and comments on POWSIM (August 2011)

The POWSIM software has now been around for some years. These pages describe a few recent updates/additions requested by users employing larger numbers of loci or alleles than can be handled by the basic version of the program included in the primary distribution package. I also comment on a bug that has now been fixed, and describe a routine for batch processing of multiple indata files.

Bug fixing

Some users have had difficulties with POWSIM crashing when running particular combinations of the number of populations, loci, and alleles per locus. This problem did not relate to the POWSIM source code, however; the crash was caused by unexpected effects resulting from engaging particular compiler directives. Present distributions of the program (version 4.1; August 2011) are compiled using slightly modified compiler settings, and this seems to have taken care of the problem with the unexpected and confusing crashes.

Program limitations

The basic version of POWSIM (*powsim.exe*) is compiled for a maximum of 30 populations (samples), 50 loci, and 50 alleles per locus. An increasing number of users, among others those working with SNPs, have asked for compilations that can handle a larger number of loci or alleles per locus. To meet these requirements two executables with other combinations of the maximum number of loci and alleles per locus are included in the present download. They are

1. *Powsim_b.exe* that is compiled for a maximum of 30 populations, 5000 loci, and 5 alleles per locus.
2. *Powsim_c.exe* that is compiled for a maximum of 50 populations, 100 loci, and 100 alleles per locus.

Other combinations may be possible to provide on request. Please note that these compilations have *not* been tested as thoroughly as the basic version (*powsim.exe*). Users must compare with outputs that have been obtained with the basic version, and make sure that the results are consistent over multiple runs and seem to make logical sense. Also, please report unexpected behavior of the program and apparently strange results.

Batch processing

Some indata files may take considerable time to process, and when running multiple such files some means for batch processing may be helpful. Such batch processing can be easily accomplished through a batch (*.bat) or a command file (*.cmd) file. As an example, the batch file *psbatch.bat* included in this download contains the commands necessary for sequentially processing the three indata files *powsim.in1*, *powsim.in2*, and *powsim.in3* (also

included; they differ in the number generations of drift). The content of *psbatch.bat* is as below.

```
===== psbatch.bat =====
ren powsim.in1 *.in
powsim
ren powsim.out *.ou1
ren powsim.in *.in1

ren powsim.in2 *.in
powsim
ren powsim.in *.in2
ren powsim.out *.ou2

ren powsim.in3 *.in
powsim
ren powsim.in *.in3
ren powsim.out *.ou3

del *.out
=====
```

As a quick test you may put the above four files in an empty directory along with *powsim.exe*, execute the command *psbatch.bat*, and check the three outputs *powsim.ou1*, *powsim.ou2*, and *powsim.ou3*. The commands in *psbatch.bat* work as follows. First, the first indata file (*powsim.in1*) is renamed to *powsim.in*, POWSIM is started, by default using *powsim.in* as indata and producing the summary output file *powsim.out*. In the next two steps *powsim.out* is renamed to *powsim.ou1*, and *powsim.in* is renamed to *powsim.in1* (its original name). This process is then repeated for the other two infiles (*powsim.in2* and *powsim.in3*), and finally potentially remaining outfiles from the last run are deleted.

The above batch example only renames and saves the summary output file (*powsim.out*) from each run; the others are overwritten when POWSIM processes the next infile. The switch for "Erase detailed output" may therefore be set to either "0" or "1"; if set to "0" the last command in the batch file erases the detailed outputs from the last run. The file *psbatch.bat* can be modified to handle any number of indata files, but remember to save it as plain ASCII text and not in some word processing format. On some computers you may have to name the batch file *psbatch.cmd* rather than *psbatch.bat* as in the present example.

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