Supplementary Material

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(a) The diagram of the construction about co-occurrence matrix relation

1) Items extracted from the original date

Publications	Items
1	K1, K2, K3
2	K2, K4, K5
3	K1, K2, K3, K4
4	K3, K4, K5
5	K1, K2, K3, K4, K5

2) Co-occurrence matrix table generated by counting and statistics

Items	K1	K2	K3	K4	K5
K1	3	3	3	2	1
K2	3	4	3	3	2
K3	3	3	4	3	2
K4	2	3	3	4	3
K5	1	2	2	3	3

i. Diagonal date represent the frequency of individual items

ii. The rest date represent the frequency of the corresponding item

For example:

I. If the corresponding items in 1) are keywords, the result is the keywords' co-occurrence matrix.

II. If the corresponding items in 1) are authors, the result is the authors' coauthoring matrix.

III. If the corresponding items in 1) are citations, the result is the co-citation matrix.

(b) The diagram of the construction about two-mode matrix relation

1) Items extracted from the original date

Publications	J items	K items
1	J1, J2	K1, K2
2	J1, J2, J3	K2, K3
3	J1, J3, J4	K1, K3, K4
4	J3, J4	K1, K2, K3, K4

2) Two-mode matrix table generated by counting and statistics

Items	K1	K2	K3	K4
J1	2	2	2	1
J2	1	2	1	0
J3	2	2	3	2
J4	2	1	2	2

For example:

I. If the J/K items in 1) are keywords/journals, the result is the Kwords-Journals two-mode matrix.

II. If the one items in1) are citations, the result is the citation coupling matrix used for bibliographic coupling analysis.

Supplement:

I. After the matrix is constructed, the data are imported into the drawing software(Bibliometric in R studio/VOSviewer) for visualization.

II. In the clustering analysis, the distance algorithm between samples is Euclidean distance algorithm, the clustering method is the ward's minimum-variance method, and the matrix standardization method uses Z-Score standardization.

Figure S1. The diagram of the construction about co-occurrence matrix and two-mode matrix relation.

Table S1. Top 10 authors with the most publications on photoperiod regulation of plant flowering.

Rank	Author	Country	Organization	TP[a]	P[b]	TLS[c]	CPP[d]	H[e]
1	Coupland.G	Germany	Max Planck Institute for Plant Breeding Research	36	0.919%	71	145.44	91
2	Imaizumi.T	USA	University of Washington	29	0.740%	59	125.83	39
3	Runkle.E	USA	Michigan State University	27	0.689%	16	29.37	35
4	Kong Fanjiang	China	Guangzhou University	23	0.587%	95	41.09	37
5	Liu Baohui	China	Guangzhou University	22	0.561%	85	45.36	41
6	Mizuno.T	Japan	Nagoya University	20	0.510%	56	57.85	71
7	Nakamichi.N	Japan	Nagoya University	20	0.510%	56	42.25	34
8	Yamashino.T	Japan	Nagoya University	19	0.485%	51	60.05	54
9	Ito.S	USA	University of Washington	18	0.459%	53	87.94	34
10	Fornara.F	Italy	University of Milan	17	0.434%	41	118.82	29

[a]Total Publications; [b]Percentage (%); [c]Total Link Strength; [d]Citations Per Paper; [e]h-index

Table S2. Top 20 publications with the most citations in the field of photoperiod regulation of plant flowering.

Rank	Title	Authors	Journal	Year	Citations	IF (2023)	Reference
1	FD, a bZIP protein mediating signals from the floral pathway integrator FT at the shoot apex	Abe, M; Kobayashi, Y; Yamamoto, S; Daimon, Y; Yamaguchi, A; Ikeda, Y; Ichinoki, H; Notaguchi, M; Goto, K; Araki, T	SCIENCE	2005	1154	56.9	Abe, M et al.(2005)
2	The genetic basis of flowering responses to seasonal cues	Andrés, F., Coupland, G.	NATURE REVIEWS GENETICS	2012	1005	42.7	Andrés, F., Coupland, G.(2012)
3	Photoreceptor regulation of CONSTANS protein in photoperiodic flowering	Valverde, F; Mouradov, A; Soppe, W; Ravenscroft, D; Samach, A; Coupland, G	SCIENCE	2004	948	56.9	Valverde, F et al.(2004)
4	Hd3a protein is a mobile flowering signal in rice	Tamaki, Shojiro; Matsuo, Shoichi; Wong, Hann Ling; Yokoi, Shuji; Shimamoto, Ko	SCIENCE	2007	887	56.9	Shojiro,T et al.(2007)
5	Improving photosynthesis and plants productivity by accelerating recovery from photoprotection	Kromdijk, J., Głowacka, K., Leonelli, L., Gabilly, S. T., Iwai, M., Niyogi, K. K., & Long, S. P.	SCIENCE	2016	797	56.9	Kromdijk, J et al.(2016)
6	Regulation and identity of florigen: FLOWERING LOCUS T moves center stage	Turck, F., Fornara, F., & Coupland, G.	ANNUAL REVIEW OF PLANT BIOLOGY	2008	781	23.9	Turck, F et al.(2008)
7	FKF1 and GIGANTEA complex formation is required for day-length Measurement in *Arabidopsis*	Sawa, M., Nusinow, D. A., Kay, S. A., & Imaizumi, T.	SCIENCE	2007	662	56.9	Sawa, M et al.(2007)
8	Regulation of flowering time: all roads lead to Rome	Srikanth, A., & Schmid, M.	CELLULAR AND MOLECULAR LIFE SCIENCES	2011	655	8	Srikanth, A., & Schmid, M. (2011)
9	*Ehd1*, a B-type response regulator in rice, confers short-day promotion of flowering and controls *FT-like* gene expression independently of *Hd1l*	Doi, K; Izawa, T; Fuse, T; Yamanouchi, U; Kubo, T; Shimatani, Z; Yano, M; Yoshimura, A	GENES & DEVELOPMENT	2004	648	10.5	Doi, K et al., (2004).
10	Cloning of the *Arabidopsis* clock cone *TOC1* , an autoregulatory response regulator homolog	Strayer, C; Oyama, T; Schultz, TF; Raman, R; Somers, DE; Más, P; Panda, S; Kreps, JA; Kay, SA	SCIENCE	2000	642	56.9	Strayer, C., et al. (2000).
11	The transcription factor FLC confers a flowering response to vernalization by repressing meristem competence and	Searle, I; He, YH; Turck, F; Vincent, C; Fornara, F; Kröber, S; Amasino, RA; Coupland, G	GENES & DEVELOPMENT	2006	636	10.5	Searle, I., et al.(2006)

	systemic signaling in *Arabidopsis*						
12	MYC2: The Master in Action	Kazan, Kemal; Manners, John M.	MOLECULAR PLANT	2013	628	27.5	Kazan, K., & Manners, J. M. (2013).
13	Adaptation of photoperiodic control pathways produces short-day flowering in rice	Hayama, R; Yokoi, S; Tamaki, S; Yano, M; Shimamoto, K	NATURE	2003	575	64.8	Hayama, R.,et al.(2003)
14	FKF1F-BOX protein mediates cyclic degradation of a repressor of *CONSTANS* in *Arabidopsis*	Imaizumi, T; Schultz, TF; Harmon, FG; Ho, LA; Kay, SA	SCIENCE	2005	574	56.9	Imaizumi, T.,et al.(2005)
15	Transcription factor PIF4 controls the thermosensory activation of flowering	Kumar, S. Vinod; Lucyshyn, Doris; Jaeger, Katja E.; Alos, Enriqueta; Alvey, Elizabeth; Harberd, Nicholas P.; Wigge, Philip A.	NATURE	2012	517	64.8	Kumar, S. V.,et al.(2012)
16	Molecular basis of seasonal time measurement in *Arabidopsis*	Yanovsky, MJ; Kay, SA	NATURE	2002	514	64.8	Yanovsky, M. J., & Kay, S. A. (2002).
17	CONSTANS and the CCAAT box binding complex share a functionally important domain and interact to regulate flowering of *Arabidopsis*	Wenkel, Stephan; Turck, Franziska; Singer, Kamy; Gissot, Lionel; Le Gourrierec, Jose; Samach, Alon; Coupland, George	PLANT CELL	2006	463	11.6	Wenkel, S.,et al.(2006)
18	Control of flowering and storage organ formation in potato by FLOWERING LOCUS T	Navarro, Cristina; Abelenda, Jose A.; Cruz-Oro, Eduard; Cuellar, Carlos A.; Tamaki, Shojiro; Silva, Javier; Shimamoto, Ko; Prat, Salome	NATURE	2011	455	64.8	Navarro, C.,et al.(2011)
19	Regulation and function of SOC1, a flowering pathway integrator	Lee, J., & Lee, I.	JOURNAL OF EXPERIMENTAL BOTANY	2010	448	6.9	Lee, J., & Lee, I. (2010).
20	FKF1 is essential for photoperiodic-specific light signalling in *Arabidopsis*	Imaizumi, T., Tran, H. G., Swartz, T. E., Briggs, W. R., & Kay, S. A.	NATURE	2003	436	64.8	Imaizumi, T et al. (2003)

Table S3. Top 10 disciplines with the most publications in photoperiod regulation of plant flowering.

Rank	Discipline	TP[a]	P[b]	CPP[c]	H[d]
1	Plant Physiology	1622	41.39%	40.89	123
2	Agricultural Science	870	22.20%	15.07	53
3	Molecular Biology	422	10.77%	54.48	82
5	Cell Biology	205	5.23%	87.67	76
4	Plant Hormone Biology	192	4.90%	95.44	59
6	Plant Genetics	181	4.62%	45.19	43
7	Agricultural Ecology	142	3.62%	27.09	32
8	Plant Biotechnology	127	3.24%	21.91	27
9	Plant Pathology	108	2.76%	20.88	25
10	Environmental Science	86	2.19%	48.8	29

[a]Total Publications; [b]Percentage (%); [c]Citations Per Paper; [d]h-index

Table S4. The top 20 plants with the most research papers published in the field of photoperiodic regulation of plant flowering.

Rank	Plant	TP[a]	P[b]	CPP[c]
1	*Arabidopsis thaliana*	473	12.07%	77.88
2	*Oryza sativa*	154	3.93%	70.68

3	*Glycine max*	100	2.55%	28.85
4	*Fragaria ananassa*	68	1.74%	27.65
5	*Chrysanthemum*	65	1.66%	16.12
6	*Solanum lycopersicum*	54	1.38%	27.09
7	*Petunia*	53	1.35%	17.77
8	*Triticum aestivum*	47	1.20%	32.85
9	*Rosa*	35	0.89%	16.00
10	*Zea mays*	31	0.79%	46.52
11	*Lilium*	27	0.69%	11.89
12	*Gossypium hirsutum*	25	0.64%	26.76
13	*Hordeum vulgare*	24	0.61%	75.33
14	*Solanum tuberosum*	21	0.54%	78.90
15	*Cymbidium*	18	0.46%	10.94
16	*Populus*	18	0.46%	34.22
17	*Cannabis*	17	0.43%	25.06
18	*Vitis vinifera*	17	0.43%	37.94
19	*Brassica napus*	16	0.41%	38.19
20	*Nicotiana tabacum*	16	0.41%	73.38

[a]Total Publications; [b]Percentage (%);[c]Citations Per Paper

Table S5. Top 10 most frequently used keywords on photoperiod regulation of plants flowering.

Rank	Keyword Plus	cluster	Links	TLS[a]	Occurrences
1	Expression	3	569	3050	1186
2	Arabidopsis	2	519	2156	944
3	Constans	3	468	2794	875
4	Flowering-time	3	217	565	867
5	Growth	1	586	2576	682
6	Photosynthesis	1	455	1372	384
7	Flowering-Locus-T	1	129	209	379
8	Time gene	3	449	2255	359
9	Floral induction	1	272	735	345
10	Leaf	1	153	242	335

[a]Total Publications